AMPCO PITTSBURGH CORP
Form 10-K
March 16, 2018
UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2017

Commission File Number 1-898

AMPCO-PITTSBURGH CORPORATION

Pennsylvania	25-1117717
(State of Incorporation)	(I.R.S. Employer ID No.)
726 Bell Avenue, Suite 301	
Carnegie, PA 15106	(412) 456-4400
(Address of principal executive offices)	(Registrant's telephone number)

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

Title of each class	Name of each exchange on which registered
Common stock, $1 par value	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 and posted on its corporate website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T(§232.405 of this chapter) during the preceding 12 months (or such shorter period that the registrant was required to submit and post such files). Yes No

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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	____	(Do not check if a small reporting company)	Smaller reporting company	____
Emerging growth company	____			

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

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

The aggregate market value of the voting stock of Ampco-Pittsburgh Corporation held by non-affiliates on June 30, 2017 (based upon the closing price of the Registrant's Common Stock on the New York Stock Exchange on that date) was approximately $89 million.

As of March 12, 2018, 12,362,198 common shares were outstanding.

Documents Incorporated by Reference: Part III of this report incorporates by reference certain information from the Proxy Statement for the 2018 Annual Meeting of Shareholders.

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FORWARD-LOOKING STATEMENTS

The Private Securities Litigation Reform Act of 1995 (the “Act”) provides a safe harbor for forward-looking statements made by us or on our behalf. Management’s Discussion and Analysis of Financial Condition and Results of Operation and other sections of the Annual Report on Form 10-K as well as the consolidated financial statements and notes thereto may contain forward-looking statements that reflect our current views with respect to future events and financial performance.

All statements in this document other than statements of historical fact are statements that are, or could be, deemed “forward-looking statements” within the meaning of the Act. In this document, statements regarding future financial position, sales, costs, earnings, cash flows, other measures of results of operations, capital expenditures or debt levels and plans, objectives, outlook, targets, guidance or goals are forward-looking statements. Words such as “may,” “intend,” “believe,” “expect,” “anticipate,” “estimate,” “project,” “forecast” and other terms of similar meaning that indicate future event and trends are also generally intended to identify forward-looking statements. Forward-looking statements speak only as of the date on which such statements are made, are not guarantees of future performance or expectations, and involve risks and uncertainties. For us, these risks and uncertainties include, but are not limited to, those described under Item 1A. Risk Factors of this Annual Report on Form 10-K. In addition, there may be events in the future that we are not able to predict accurately or control which may cause actual results to differ materially from expectations expressed or implied by forward-looking statements. Except as required by applicable law, we assume no obligation, and disclaim any obligation, to update forward-looking statements whether as a result of new information, events or otherwise.

– PART I –

ITEM 1. BUSINESS

GENERAL DEVELOPMENT OF BUSINESS

Ampco-Pittsburgh Corporation (the “Corporation”) was incorporated in Pennsylvania in 1929. The Corporation, individually or together with its consolidated subsidiaries, is also referred to herein as the “Registrant.” The Corporation classifies its businesses in two segments: Forged and Cast Engineered Products and Air and Liquid Processing.

FINANCIAL INFORMATION ABOUT SEGMENTS

The sales and operating results of the Corporation’s two segments and the identifiable assets attributable to both segments for the three years ended December 31, 2017, are set forth in Note 21 (Business Segments) of this Annual Report on Form 10-K.

NARRATIVE DESCRIPTION OF BUSINESS

Forged and Cast Engineered Products Segment

Union Electric Steel Corporation produces ingot and forged products that service a wide variety of industries globally. It specializes in the production of forged hardened steel rolls used in cold rolling by producers of steel, aluminum and other metals throughout the world. In addition, it produces ingot and open-die forged products which are used in the oil and gas industry and the aluminum and plastic extrusion industries. Union Electric Steel Corporation is headquartered in Carnegie, Pennsylvania, with three manufacturing facilities in Pennsylvania, one in Indiana and one in Ohio. It is one of the largest producers of forged hardened steel rolls in the world. In addition to a few domestic competitors, several major European, South American and Asian manufacturers also compete in both the domestic and foreign markets. In 2007, a subsidiary of Union Electric Steel Corporation became a 49% partner in a joint venture in China to manufacture large forged backup rolls, principally in weights and sizes larger than those which can be made in the subsidiary's facilities in the United States. In 2016, the ownership interest in the joint venture was reduced to 33%.

The following entities are indirect subsidiaries of Union Electric Steel Corporation:

Union Electric Steel UK Limited produces cast rolls for hot and cold strip mills, medium/heavy section mills and plate mills in a variety of iron and steel qualities. It is located in Gateshead, England, and is a major supplier of cast rolls to the metalworking industry worldwide. It primarily competes with European, Asian and North and South American companies in both domestic and foreign markets. Union Electric Steel UK Limited is a 24% partner in a Chinese joint venture which produces cast rolls.

Åkers Sweden AB produces cast rolls for hot strip finishing, roughing mills and plate mills and medium/heavy section mills in a variety of iron and steel qualities. It is located in Åkers Styckebruk, Sweden.

Åkers Valji Ravne d.o.o. produces forged rolls for cluster mills and Z-Hi mills, work rolls for narrow and wide strip and aluminum mills, back-up rolls for narrow strip mills, as well as leveling rolls and shafts. It is located in Ravne, Slovenia.

Shanxi Åkers TISCO Roll Co. Ltd., is a joint venture between Taiyuan Iron and Steel Co Ltd. and Åkers AB, a subsidiary of Union Electric Steel Corporation, that produces cast hot strip mill work rolls. It is located in Taiyuan, Shanxi Province, China. Åkers AB holds a 60% interest in the joint venture.

National Roll Company is a division of Akers National Roll Company, a subsidiary of Union Electric Steel Corporation, that produces cast rolls for hot and cold strip mills, as well as plate mills. It is located in Avonmore, Pennsylvania.

Vertical Seal Company is a division of Akers National Roll Company that manufactures bearings, bushings, key and keyless bearing sleeves, as well as provides a number of services, including rebuild of mill spare parts, chock inspection and repair, and onsite inspections and installations. It is located in Pleasantville, Pennsylvania.

ASW Steel Inc. is a premier specialty steel producer located in Welland, Ontario, Canada.

Alloys Unlimited Processing, LLC is a distributor of tool steels, alloys and carbon round bar, located in Austintown, Ohio.

Air and Liquid Processing Segment

Aerofin Division of Air & Liquid Systems Corporation produces custom-engineered finned tube heat exchange coils and related heat transfer products for a variety of industries including nuclear power generation, automotive, industrial process and HVAC, and is located in Lynchburg, Virginia.

Buffalo Air Handling Division of Air & Liquid Systems Corporation produces large custom air handling systems used in commercial, institutional and industrial buildings and is located in Amherst, Virginia.

Buffalo Pumps Division of Air & Liquid Systems Corporation manufactures a line of centrifugal pumps for the refrigeration, power generation and marine defense industries and is located in North Tonawanda, New York.

All three of the divisions in this segment are principally represented by a common independent sales organization and have several major competitors.

In both segments, the products are dependent on engineering, principally custom designed, and are sold to sophisticated commercial and industrial users located throughout the world.

For additional information on the products produced and financial information about each segment, see Note 21 (Business Segments) of this Annual Report on Form 10-K.

Raw Materials

Raw materials used in both segments are generally available from many sources and neither segment is dependent upon any single supplier for any raw material. Substantial volumes of raw materials used by each segment are subject to significant variations in price. The Corporation’s subsidiaries generally do not purchase or commit for the purchase of a major portion of raw materials significantly in advance of the time they require such materials but do make forward commitments for the supply of natural gas and certain commodities (copper and aluminum). See Note 13 (Derivative Instruments) of this Annual Report on Form 10-K.

Patents and Trademarks

While the Corporation and its subsidiaries hold some patents, trademarks and licenses, in the opinion of management they are not material to either segment.

Backlog

The backlog of orders at December 31, 2017, was approximately $326 million, compared to a backlog of $234 million at year-end 2016. Approximately 6% of the backlog is expected to be released after 2018.

Competition

The Corporation faces considerable competition from a large number of companies in both segments. The Corporation believes, however, that its subsidiaries are significant participants in each of the niche markets which they serve. Competition in both segments is based on quality, service, price and delivery. For additional information, see Part I, Item 1 "General Development of Business" of this Annual Report on Form 10-K.

Research and Development

As part of an overall strategy to develop new markets and maintain a leadership position in each of the industry niches served, the Corporation's subsidiaries in both segments incur expenditures for research and development. The activities that are undertaken are designed to develop new products, improve existing products and processes, enhance product quality, adapt products to meet customer specifications and reduce manufacturing costs. In the aggregate, these expenditures approximated $3.39 million in 2017, $2.72 million in 2016 and $1.14 million in 2015.

Environmental Protection Compliance Costs

Expenditures for environmental control matters were not material to either segment in 2017 and are not expected to be material in 2018.

Employees

On December 31, 2017, the Corporation and its subsidiaries had 1,943 active employees.

FINANCIAL INFORMATION ABOUT GEOGRAPHIC AREAS

The Forged and Cast Engineered Products segment has manufacturing operations in the United States, England, Sweden, Slovenia, China and Canada; and sales offices in Brazil, China, Canada, Egypt, France, Germany, Singapore, Slovenia, Sweden, Taiwan and Turkey. For financial information relating to foreign and domestic operations see Note 21 (Business Segments) of this Annual Report on Form 10-K.

AVAILABLE INFORMATION

The Corporation files annual, quarterly and current reports, amendments to those reports, proxy statements and other information with the Securities and Exchange Commission ("SEC"). You may access and read the Corporation's filings without charge through the SEC's website at www.sec.gov. You may also read and copy any document the Corporation files at the SEC's Public Reference Room located at 100 F. Street, N.E., Room 1580, Washington, DC 20549. Please call the SEC at 1-800-SEC-0330 for further information on the Public Reference Room.

The Corporation's internet address is www.ampcopittsburgh.com. The Corporation makes available, free of charge on its internet website, access to these reports as soon as reasonably practicable after such material is filed with, or furnished to, the SEC. The information on the Corporation's website is not part of this Annual Report on Form 10-K.

EXECUTIVE OFFICERS

The name, age, position with the Corporation[(1)] and business experience for the past five years of the Executive Officers of the Corporation are as follows:

John S. Stanik (age 64). Mr. Stanik has served as the Corporation's Chief Executive Officer since January 2015. He previously worked at Calgon Carbon Corporation, an international company specializing in purification products, technologies and services, from 1991 through 2012, when he retired for personal reasons. Mr. Stanik served as President and Chief Executive Officer of Calgon Carbon from 2003 to 2012 and became its Chairman of the Board in 2007. On October 3, 2017, the Corporation announced that Mr. Stanik had notified the Board of Directors of the Corporation of his intention to retire as Chief Executive Officer sometime in the middle of 2018 or at such time as a suitable successor is identified and appointed.

Rose Hoover (age 62). Ms. Hoover has been employed by the Corporation for more than thirty-five years. She has served as President and Chief Administrative Officer of the Corporation since August 2015 and Executive Vice President from 2011 to August 2015.

Michael G. McAuley (age 54). Mr. McAuley has served as Vice President, Chief Financial Officer and Treasurer of the Corporation since April 2016. Mr. McAuley was named Senior Vice President in March 2018. Previously, he served as Senior Vice President and Chief Financial Officer of RTI International Metals, Inc., a producer of titanium mill products and fabricated metal components, from July 2014 to October 2015; Chief Financial Officer of ECI Development, Ltd., a private real estate developer, from January 2013 until June 2014, and Vice President and Treasurer of Goodrich Corporation, a manufacturer of aerospace and defense components and systems, from December 2007 until July 2012.

Maria Trainor (age 43). Ms. Trainor has served as Vice President, General Counsel and Secretary of the Corporation since June 2015. Prior to joining the Corporation, Ms. Trainor was a partner at K&L Gates, LLP, an international law firm, where she had practiced for nearly fourteen years.

Rodney L. Scagline (age 51). Mr. Scagline has served as President of Union Electric Steel Corporation since November 2015; Executive Vice President of Union Electric Steel Corporation from April 2014 to November 2015, Vice President of Manufacturing of Union Electric Steel Corporation from June 2013 to April 2014 and Director of Technology of Union Electric Steel Corporation from July 2011 to May 2013. He previously worked at Akers National Roll Company, a cast engineered product manufacturer that was acquired by the Corporation in 2016 as part of the Åkers group acquisition, where he served as its Vice President of Metallurgical Services for three years and Vice President of Sales and Marketing for one year.

Terrence W. Kenny (age 58). Mr. Kenny has been employed by the Corporation for more than thirty years. He has served as President of the Air & Liquid Systems Corporation for more than five years.

Timothy R. Clutterbuck (age 59). Mr. Clutterbuck has served as President of ASW Steel Inc. since November 2011.

(1) Officers serve at the discretion of the Board of Directors and none of the listed individuals serves as a director of a public company, except Mr. Stanik is a director of the Corporation and F.N.B. Corporation.

ITEM 1A. RISK FACTORS

From time to time, important factors may cause actual results to differ materially from future expected results based on performance expressed or implied by any forward-looking statements made by us, including known and unknown risks, uncertainties and other factors, many of which are not possible to predict or control. Several of these factors are described from time to time in our filings with the Securities and Exchange Commission, but the factors described in filings are not the only risks that the Corporation faces.

Cyclical demand for products and economic downturns may reduce the demand for, and sales of, our products, which could adversely affect our margins and profitability.

A significant portion of the Forged and Cast Engineered Products segment's sales consists of mill rolls to customers in the global steel industry which can be periodically impacted by economic or cyclical downturns. Such downturns, the timing and length of which are difficult to predict, may reduce the demand for, and sales of, our forged and cast steel rolls both in the United States and the rest of the world. Lower demand for rolls may also adversely impact profitability as other competing roll producers lower selling prices in the marketplace in order to fill their manufacturing capacity. Cancellation of orders or deferral of delivery of rolls may occur and produce an adverse impact on financial results. In addition, sales of non-roll product, consisting of open-die forged product primarily for the oil and gas industries, are impacted by fluctuations in global energy prices.

Excess global capacity in steel industry could lower prices for our products, which would adversely affect our sales, margins and profitability, as well as collectability of receivables and salability of in-process inventory.

The global steel manufacturing capacity continues to exceed global consumption of steel products. Such excess capacity often results in manufacturers in certain countries exporting steel at prices significantly below their home market prices (often due to local government assistance or subsidies), which leads to global market destabilization and reduced sales and profitability of some of our and our subsidiaries' customers, which, in turn, affects our sales and profit margins, as well as collectability of receivables and salability of in-process inventory.

Steel industry consolidation resulted in certain customers having increased buying power, which could put pressure on prices of our products and result in lower profit margins.

As a result of reduced demand for steel products, the steel industry has undergone structural change by way of consolidation and mergers. In certain markets, the resultant reduction in the number of steel plants and the increased buying power of the enlarged steel producing companies may put pressure on the selling prices and profit margins of mill rolls.

A reduction in the level of export sales, as well as other economic factors in foreign countries, may have an adverse impact on our financial results.

Exports are a significant proportion of our subsidiaries' sales. Historically, changes in foreign exchange rates, particularly in respect of the U.S. dollar, British pound, Swedish krona and the euro, have impacted the export of our products and may do so again in the future. Other factors that may adversely impact export sales and operating results include political and economic instability, export controls, changes in tax laws and tariffs and new indigenous producers in overseas markets. A reduction in the level of export sales may have an adverse impact on our financial results. In addition, exchange rate changes may allow foreign roll suppliers to compete in our home markets.

Fluctuation of the value of the U.S. dollar relative to other currencies may adversely affect our business, results of operations and financial condition.

Certain of our subsidiaries operate in foreign jurisdictions and, accordingly, earn revenues, pay expenses, own assets and incur liabilities in countries using currencies other than the U.S. dollar. Since our consolidated financial statements are presented in U.S. dollars, we must translate revenues and expenses into U.S. dollars at the average exchange rate during each reporting period, and assets and liabilities into U.S. dollars at the exchange rate in effect at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. dollar against other major currencies will affect the translated value for revenue, expenses and balance sheet items denominated in foreign currencies and could materially affect our financial results expressed in U.S. dollars.

A downturn in capital spending in the United States and other jurisdictions may reduce demand for and sales of certain of our products, which would result in reduced profit margins.

Each of our businesses is susceptible to the general level of economic activity, particularly as it impacts industrial and construction capital spending. A downturn in capital spending in the United States and elsewhere may reduce demand for and sales of our subsidiaries' air handling, power generation and refrigeration equipment, forged engineered products and mill rolls. Lower demand may also reduce profit margins due to our competitors and us striving to maximize manufacturing capacity by lowering prices.

Commodity price increases, as well as any reductions in electricity, gas supply or shortage of key production materials, could adversely impact our production, which would result in lower profitability.

Our subsidiaries use certain commodities in the manufacture of their products. These include steel scrap, ferroalloys, energy and graphite electrodes. Any sudden price increase may cause a reduction in profit margins or losses where fixed-priced contracts have been accepted or increases cannot be obtained in future selling prices. In addition, there may be curtailment in electricity or gas supply which would adversely impact production. Shortage of critical materials, while driving up costs, may be of such severity as to disrupt production, all of which may impact sales and profitability. The current global supply shortage of graphite electrodes used for electric arc furnace melting of our steels could materially impact results of operations should we be unable to secure sufficient supply for our production requirements.

We may not be able to realize the expected benefits from the acquisitions that we make, and we may experience difficulties in integrating the acquired businesses.

We have made in the past, and may continue to make, certain acquisitions and enter into joint ventures, which are intended to complement or expand our businesses. These acquisitions involve a variety of challenges and risks. We may encounter difficulties integrating acquired businesses with our operations or applying our internal control processes to these acquisitions. Other risks associated with acquisitions are the diversion of management's attention from other business concerns, the potential loss of key employees and customers of the acquired companies, the possible assumption of unknown liabilities, and potential disputes with the sellers. We may not be able to complete certain acquisitions due to antitrust laws and regulations in various jurisdictions. Additionally, we may not realize the degree of timing of benefits we anticipate when we first enter into a transaction. Any of the foregoing could adversely affect our business and results of operations.

A work stoppage or another industrial action on the part of any of our unions may be disruptive to our operations.

Our subsidiaries have several key operations which are subject to multi-year collective bargaining agreements with their hourly work forces. While we believe we have good relations with our unions, there is the risk of industrial action or work stoppage at the expiration of an agreement if contract negotiations break down, which may disrupt manufacturing and impact results of operations.

Dependence on certain equipment may cause an interruption in our production if such equipment is out of operation for an extended period of time, which would result in lower sales and profitability.

Our subsidiaries' principal business relies on certain unique equipment such as an electric arc furnace and a spin cast work roll machine. Although a comprehensive critical spare inventory of key components for this equipment is maintained, if any such unique equipment is out of operation for an extended period, it may result in a significant reduction in our sales and earnings.

The ultimate liability of our subsidiaries for claims alleging personal injury from exposure to asbestos-containing components historically used in certain products of our subsidiaries could have a material adverse effect on our consolidated financial condition or liquidity in the future.

Our subsidiaries, and in some cases, we, are defendants in numerous claims alleging personal injury from exposure to asbestos-containing components historically used in certain products of our subsidiaries. Through year-end 2017, our insurance has covered a substantial majority of our settlement and defense costs. We believe that the estimated costs net of anticipated insurance recoveries of our pending and future asbestos legal proceedings for the next ten years should not have a material adverse effect on our consolidated financial condition or liquidity. However, there can be no assurance that our subsidiaries or we will not be subject to significant additional claims in the future or that our subsidiaries' ultimate liability with respect to asbestos claims will not present significantly greater and longer lasting financial exposure than provided in our consolidated financial statements. The ultimate net liability with respect to such pending and any unasserted claims is subject to various uncertainties, including the following:

- the number of claims that are brought in the future;
- the costs of defending and settling these claims;
- insolvencies among our insurance carriers and the risk of future insolvencies;
- the possibility that adverse jury verdicts could require damage payments in amounts greater than the amounts for which we have historically settled claims;
- possible changes in the litigation environment or federal and state law governing the compensation of asbestos claimants; and
- the risk that the bankruptcies of other asbestos defendants may increase our costs.

Because of the uncertainties related to such claims, it is possible that the ultimate liability could have a material adverse effect on our consolidated financial condition or liquidity in the future.

The loss of any of our key management or our inability to attract or retain qualified personnel may prevent us from our implementing our business strategy.

Our success is dependent on the management, experience and leadership skills of our senior management team and key employees. The loss of any of these individuals or an inability to attract, retain and maintain additional personnel with similar industry experience could prevent us from implementing our business strategy. We cannot assure you that we will be able to retain our existing senior management and key personnel or to attract additional qualified personnel when needed.

Potential attacks on information technology infrastructure and other cyber-based business disruptions could have a material adverse effect on our financial condition and results of operations.

We depend on integrated information technology ("IT") systems to conduct our business. IT systems failures, including risks associated with upgrading our systems or in successfully integrating IT and other systems in connection with the integration of businesses we acquire, network disruptions and breaches of data security could disrupt our operations by impeding our processing of transactions, our ability to protect customer or company information and our financial reporting. Our computer systems, including our back-up systems, could be damaged or interrupted by power outages, computer and telecommunications failures, computer viruses, internal or external security breaches, events such as fires, earthquakes, floods, tornadoes and hurricanes, and/or errors by our employees. Cyber-based risks, in particular, are evolving and include both attacks to our IT infrastructure and attacks to the IT infrastructure of third parties in attempts to gain unauthorized access to our confidential or other proprietary information, or information relating to our employees, customers and other third parties. Although we have taken steps to address these concerns, there can be no assurance that a system failure or data security breach will not have a material adverse effect on our financial condition and results of operations.

We could be exposed to substantial liabilities resulting from non-compliance with domestic and international environmental laws and regulations.

We and our subsidiaries are subject to various domestic and international environmental laws and regulations that govern the discharge of pollutants and disposal of wastes and which may require that we and our subsidiaries investigate and remediate the effects of the release or disposal of materials at sites associated with past and present operations. We and our subsidiaries could incur substantial cleanup costs, fines and civil or criminal sanctions, third party property damage or personal injury claims as a result of violations or liabilities under these laws or non-compliance with environmental permits required at our facilities.

A change in the existing regulatory environment could negatively affect our operations and financial performance.

We are subject to a wide variety of complex domestic and foreign laws, rules and regulations, and legal compliance risks, including, without limitation, securities laws, employment and pension-related laws, competition laws, export controls and sanctions laws, data privacy and security laws, and laws governing improper business practices. We are affected by new laws and regulations, and changes to existing laws and regulations, including interpretations by courts and regulators. These laws, regulations and policies, and changes thereto, may result in restrictions or limitations to our current operational practices and processes and product/service offerings which could negatively impact our current cost structure, revenue streams, cash flows, and overall financial position.

Additionally, we are subject to tax laws and regulations in the United States and multiple foreign jurisdictions. We are affected by changes in tax laws and regulations, as well as changes in related interpretations and other tax guidance. In the ordinary course of our business, we are subject to examinations and investigations by various tax authorities. In addition to existing examinations and investigations, there could be further examinations and investigations in the future, and existing examinations and investigations could be expanded.

On December 22, 2017, the U.S. federal government enacted the Tax Cuts and Jobs Act (the “Tax Reform”), to become effective as of January 1, 2018, which, among other things, lowered the U.S. corporate statutory income tax rate from 35% to 21%, implemented a modified territorial tax system and imposed a one-time tax on deemed repatriated earnings of foreign subsidiaries. The Tax Reform contains numerous complex provisions impacting U.S. multinational companies, and we continue to review and assess the legislative language and its potential impact on us. The full extent of the impact remains uncertain at this time, and our current interpretations of, and assumptions regarding, the Tax Reform are subject to additional regulatory or administrative developments, including any regulations or other guidance promulgated by the U.S. Internal Revenue Service. As a result, the Tax Reform, including any regulations or other guidance promulgated by the U.S. Internal Revenue Service, and other tax laws could have significant effects on us, some of which may be adverse and could materially and adversely impact our financial condition, results of operations and cash flows.

In 2018, President Trump announced he would impose tariffs of 25% on steel imports and 10% on aluminum imports. As consumers of steel and aluminum in some of our Air & Liquid Processing segment products, our costs could be significantly impacted if the tariffs are imposed, potentially reducing our margins and risking loss of market share to foreign competitors not subject to similar tariffs. In addition, in the ordinary course of business, one of our U.S. subsidiaries purchases intercompany steel produced by another subsidiary located in Canada, which also exports steel to customers in the U.S. Canada is temporarily exempted from the proposed tariffs. If this exemption is not made permanent, we could lose margin and/or market share for the related business. Uncertainties regarding the scope of the proposed tariffs could also pose potential risk to the cost of certain intercompany value-added intermediary product transfers. Accordingly, our financial condition, results of operations and cash flows could be significantly affected.

New trade restrictions and regulatory burdens associated with “Brexit” could adversely impact our operations and financial performance.

On June 23, 2016, voters in the United Kingdom approved a referendum to exit from the European Union (“E.U.”), commonly known as “Brexit.” As the United Kingdom and the E.U. continue negotiations to determine their new relationship, greater restrictions and regulatory burdens may be put upon trade between the United Kingdom and the E.U. This may have an adverse effect on our operations and financial performance.

We may face limitations in availability of capital to fund our growth strategy.

We are parties to a Revolving Credit and Security Agreement (the “Credit Agreement”), a senior secured asset-based revolving credit facility collateralized by a first priority perfected security interest in substantially all of our assets. The Credit Agreement provides for initial borrowings not to exceed $100 million, with an option to increase the credit facility by an additional $50 million at our request and with the approval of the banks, but restricts us from incurring additional indebtedness outside of the Credit Agreement. The Credit Agreement is subject to various affirmative and negative covenants and contains various sub-limits, including those based on type of collateral and borrowings by geographic region. If the financial covenants become difficult to meet or if our borrowing needs increase beyond the prescribed limits, our results of operations and liquidity may be materially adversely affected. In addition, our access to public debt markets may be limited based on our size, credit profile and not being a well-known seasoned issuer.

ITEM 1B. UNRESOLVED STAFF COMMENTS

The Corporation has no unresolved staff comments.

ITEM 2. PROPERTIES

The location and general character of the principal locations in each segment, all of which are owned unless otherwise noted, are listed below. In addition, we have sales offices in the following countries: Brazil, China, Egypt, France, Germany, Singapore, Slovenia, Sweden, Turkey and Taiwan. See Note 5 (Property, Plant and Equipment) and Note 8 (Borrowing Arrangements) of this Annual Report on Form 10-K for disclosure of properties held as collateral.

Company and Location	Principal Use	Approximate Square Footage	Type of Construction
FORGED AND CAST ENGINEERED PRODUCTS SEGMENT			
Union Electric Steel Corporation			
Route 18 Burgettstown, PA 15021	Manufacturing facilities	296,800 on 55 acres	Metal and steel
726 Bell Avenue Carnegie, PA 15106	Manufacturing facilities and offices	165,900 on 8.7 acres	Metal and steel
U.S. Highway 30 Valparaiso, IN 46383	Manufacturing facilities	88,000 on 20 acres	Metal and steel
1712 Greengarden Road Erie, PA 16501	Manufacturing facilities	40,000*	Metal and steel
Union Electric Steel UK Limited			
Coulthards Lane		274,000 on 10 acres	

Gateshead, England	Manufacturing facilities and offices		Steel framed, metal and brick
Åkers Sweden AB Bruksallén 12SE-647 51 Åkers Styckebruk, Sweden	Manufacturing facilities and offices	394,000 on 162 acres	Steel framed, metal and brick
Åkers Valji Ravne d.o.o. Koroška c. 14 SI-2390 Ravne na Koroškem, Slovenia	Manufacturing facilities and offices	106,000 on 2.1 acres	Brick
Akers National Roll Company 400 Railroad Avenue Avonmore, PA 15618	Manufacturing facilities and offices	140,000 on 29.5 acres	Metal and steel
Vertical Seal Company 162 Chapman Road Pleasantville, PA 16341	Manufacturing facilities and offices	52,000 on 57 acres	Metal, steel and concrete
Shanxi Åkers TISCO Roll Co. Ltd.			

Company and Location	Principal Use	Approximate Square Footage	Type of Construction
No. 2 Jian Cao Ping Taiyuan, Shanxi, China	Manufacturing facilities and offices	338,000 on 14.6 acres	Metal, steel and brick
Alloys Unlimited and Processing, LLC 3760 Oakwood Avenue Austintown, Ohio 44515	Manufacturing facilities and offices	69,800*	Steel framed and cement block
ASW Steel Inc. 42 Centre Street Welland, ON, Canada L3B 5N9	Manufacturing facilities and offices	813,500 on 76 acres	Metal and steel
AIR AND LIQUID PROCESSING SEGMENT			
Air & Liquid Systems Corporation Aerofin Division 4621 Murray Place Lynchburg, VA 24506	Manufacturing facilities and offices	146,000 on 15.3 acres	Brick, concrete and steel
Buffalo Air Handling Division Zane Snead Drive Amherst, VA 24531	Manufacturing facilities and offices	89,000 on 19.5 acres	Metal and steel
Buffalo Pumps Division 874 Oliver Street N. Tonawanda, NY 14120	Manufacturing facilities and offices	94,000 on 9 acres	Metal, brick and cement block

*Facility is leased.

The Corporation leases office space from Union Electric Steel Corporation. The Corporation subleases a portion of its office space to Air & Liquid Systems Corporation for use as its headquarters. All of the owned facilities are adequate and suitable for their respective purposes.

The Forged and Cast Engineered Products segment's facilities operated within 65% to 75% of their normal capacity during 2017. The facilities of the Air and Liquid Processing segment operated within 60% to 70% of their normal capacity. Normal capacity is defined as capacity under approximately normal conditions with allowances made for unavoidable interruptions, such as lost time for repairs, maintenance, breakdowns, set-up, failure, supply delays, labor shortages and absences, Sundays, holidays, vacation, inventory taking. The number of work shifts is also taken into consideration.

ITEM 3. LEGAL PROCEEDINGS

LITIGATION

The Corporation and its subsidiaries are involved in various claims and lawsuits incidental to their businesses and are also subject to asbestos litigation as described below. In February 2017, the Corporation, its indirect subsidiary Akers National Roll Company, as well as the Akers National Roll Company Health & Welfare Benefits Plan were named as defendants in a class action complaint filed in the United States District Court for the Western District of Pennsylvania, where the plaintiffs (currently retired former employees of Akers National Roll Company and the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial, and Service Workers International Union, AFL-CIO) alleged that the defendants breached collective bargaining agreements and violated the benefit plan by modifying medical benefits of the plaintiffs and similarly situated retirees. The defendants moved to dismiss the case, and plaintiffs petitioned the court to compel arbitration. On June 13, 2017, the District Court compelled arbitration and denied the defendants' motion to dismiss as moot. Defendants appealed this decision to the Third Circuit Court of Appeals on June 21, 2017. Defendants also filed a motion to stay arbitration pending the resolution of the appeal, and that motion was granted on September 5, 2017. The Third Circuit Court of Appeals will next consider whether the District Court erred in compelling arbitration. While no assurance can be given as to the ultimate outcome of this matter, we believe that the final resolution of this action will not have a material adverse effect on our results of operations, financial position, liquidity or capital resources.

Asbestos Litigation

Claims have been asserted alleging personal injury from exposure to asbestos-containing components historically used in some products manufactured by predecessors of Air & Liquid Systems Corporation ("Asbestos Liability"). Air & Liquid Systems Corporation ("Air & Liquid"), and in some cases the Corporation, are defendants (among a number of defendants, often in excess of 50) in cases filed in various state and federal courts.

Asbestos Claims

The following table reflects approximate information about the claims for Asbestos Liability against Air & Liquid and the Corporation for the two years ended December 31, 2017, and 2016.

(dollars in thousands)	2017	2016
Total claims pending at the beginning of the period	6,618	6,212
New claims served	1,365	1,452
Claims dismissed	(718)	(782)
Claims settled	(358)	(264)
Total claims pending at the end of the period [1]	6,907	6,618
Gross settlement and defense costs (in 000's)	$21,431	$17,960
Average gross settlement and defense costs per claim resolved (in 000's)	$19.92	$17.17

(1) Included as "open claims" are approximately 479 and 444 claims in 2017 and 2016, respectively, classified in various jurisdictions as "inactive" or transferred to a state or federal judicial panel on multi-district litigation, commonly referred to as the MDL.

A substantial majority of the settlement and defense costs reflected in the above table was reported and paid by insurers. Because claims are often filed and can be settled or dismissed in large groups, the amount and timing of settlements, as well as the number of open claims, can fluctuate significantly from period to period.

Asbestos Insurance

The Corporation and Air & Liquid are parties to a series of settlement agreements ("Settlement Agreements") with insurers that have coverage obligations for Asbestos Liability (the "Settling Insurers"). Under the Settlement Agreements, the Settling Insurers accept financial responsibility, subject to the terms and conditions of the respective agreements, including overall coverage limits, for pending and future claims for Asbestos Liability. The Settlement Agreements encompass the substantial majority of insurance policies that provide coverage for claims for Asbestos Liability.

The Settlement Agreements include acknowledgements that Howden North America, Inc. ("Howden") is entitled to coverage under policies covering Asbestos Liability for claims arising out of the historical products manufactured or distributed by Buffalo Forge, a former subsidiary of the Corporation (the "Products"). The Settlement Agreements do not provide for any prioritization on access to the applicable policies or any sublimits of liability as to Howden or the Corporation and Air & Liquid, and, accordingly, Howden may access the coverage afforded by the Settling Insurers for any covered claim arising out of a Product. In general, access by Howden to the coverage afforded by the Settling Insurers for the Products will erode coverage under the Settlement Agreements available to the Corporation and Air &

Liquid for Asbestos Liability.

Asbestos Valuations

In 2006, the Corporation retained Hamilton, Rabinovitz & Associates, Inc. ("HR&A"), a nationally recognized expert in the valuation of asbestos liabilities, to assist the Corporation in estimating the potential liability for pending and unasserted future claims for Asbestos Liability. Based on this analysis, the Corporation recorded a reserve for Asbestos Liability claims pending or projected to be asserted through 2013 as of December 31, 2006. HR&A's analysis has been periodically updated since that time. Most recently, the HR&A analysis was updated in 2016, and additional reserves were established by the Corporation as of December 31, 2016, for Asbestos Liability claims pending or projected to be asserted through 2026. The methodology used by HR&A in its projection in 2016 of the operating subsidiaries' liability for pending and unasserted potential future claims for Asbestos Liability, which is substantially the same as the methodology employed by HR&A in prior estimates, relied upon and included the following factors:

- HR&A's interpretation of a widely accepted forecast of the population likely to have been exposed to asbestos;
- epidemiological studies estimating the number of people likely to develop asbestos-related diseases;

- HR&A's analysis of the number of people likely to file an asbestos-related injury claim against the subsidiaries and the Corporation based on such epidemiological data and relevant claims history from January 1, 2014, to September 9, 2016;
- an analysis of pending cases, by type of injury claimed and jurisdiction where the claim is filed;
- an analysis of claims resolution history from January 1, 2014, to September 9, 2016, to determine the average settlement value of claims, by type of injury claimed and jurisdiction of filing; and
- an adjustment for inflation in the future average settlement value of claims, at an annual inflation rate based on the Congressional Budget Office's ten year forecast of inflation.

Using this information, HR&A estimated in 2016 the number of future claims for Asbestos Liability that would be filed through the year 2026, as well as the settlement or indemnity costs that would be incurred to resolve both pending and future unasserted claims through 2026. This methodology has been accepted by numerous courts.

In conjunction with developing the aggregate liability estimate referenced above, the Corporation also developed an estimate of probable insurance recoveries for its Asbestos Liabilities. In developing the estimate, the Corporation considered HR&A's projection for settlement or indemnity costs for Asbestos Liability and management's projection of associated defense costs (based on the current defense to indemnity cost ratio), as well as a number of additional factors. These additional factors included the Settlement Agreements then in effect, policy exclusions, policy limits, policy provisions regarding coverage for defense costs, attachment points, prior impairment of policies and gaps in the coverage, policy exhaustions, insolvencies among certain of the insurance carriers, and the nature of the underlying claims for Asbestos Liability asserted against the subsidiaries and the Corporation as reflected in the Corporation's asbestos claims database, as well as estimated erosion of insurance limits on account of claims against Howden arising out of the Products. In addition to consulting with the Corporation's outside legal counsel on these insurance matters, the Corporation consulted with a nationally recognized insurance consulting firm it retained to assist the Corporation with certain policy allocation matters that also are among the several factors considered by the Corporation when analyzing potential recoveries from relevant historical insurance for Asbestos Liabilities. Based upon all of the factors considered by the Corporation, and taking into account the Corporation's analysis of publicly available information regarding the credit-worthiness of various insurers, the Corporation estimated the probable insurance recoveries for Asbestos Liability and defense costs through 2026. Although the Corporation believes that the assumptions employed in the insurance valuation were reasonable and previously consulted with its outside legal counsel and insurance consultant regarding those assumptions, there are other assumptions that could have been employed that would have resulted in materially lower insurance recovery projections.

Based on the analyses described above, the Corporation's reserve at December 31, 2016, for the total costs, including defense costs, for Asbestos Liability claims pending or projected to be asserted through 2026, was $171 million of which approximately 70% was attributable to settlement costs for unasserted claims projected to be filed through 2026 and future defense costs. The reserve at December 31, 2017, was $150 million. While it is reasonably possible that the Corporation will incur additional charges for Asbestos Liability and defense costs in excess of the amounts currently reserved, the Corporation believes that there is too much uncertainty to provide for reasonable estimation of the number of future claims, the nature of such claims and the cost to resolve them beyond 2026. Accordingly, no reserve has been recorded for any costs that may be incurred after 2026.

The Corporation's receivable at December 31, 2016, for insurance recoveries attributable to the claims for which the Corporation's Asbestos Liability reserve has been established, including the portion of incurred defense costs covered by the Settlement Agreements in effect through December 31, 2016, and the probable payments and reimbursements relating to the estimated indemnity and defense costs for pending and unasserted future Asbestos Liability claims, was $116 million ($100 million at December 31, 2017).

The following table summarizes activity relating to insurance recoveries for each of the years ended December 31, 2017, and 2016.

(dollars in thousands)	2017	2016
Insurance receivable – asbestos, beginning of the year	$115,945	$125,423
Settlement and defense costs paid by insurance carriers [1]	(15,603)	(23,138)
Changes in estimated coverage	0	13,660
Insurance receivable – asbestos, end of the year	$100,342	$115,945

(1) Settlement and defense costs paid by insurance carriers for 2016 includes a lump sum cash settlement with an insurance carrier of $9,808.

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The insurance receivable recorded by the Corporation does not assume any recovery from insolvent carriers and a substantial majority of the insurance recoveries deemed probable is from insurance companies rated A – (excellent) or better by A.M. Best Corporation. There can be no assurance, however, that there will not be further insolvencies among the relevant insurance carriers, or that the assumed percentage recoveries for certain carriers will prove correct. The difference between insurance recoveries and projected costs is not due to exhaustion of all insurance coverage for Asbestos Liability. The Corporation and the subsidiaries have substantial additional insurance coverage which the Corporation expects to be available for Asbestos Liability claims and defense costs that the subsidiaries and it may incur after 2026. However, this insurance coverage also can be expected to have gaps creating significant shortfalls of insurance recoveries against claims expense, which could be material in future years.

The amounts recorded by the Corporation for Asbestos Liabilities and insurance receivables rely on assumptions that are based on currently known facts and strategy. The Corporation's actual expenses or insurance recoveries could be significantly higher or lower than those recorded if assumptions used in the Corporation's or HR&A's calculations vary significantly from actual results. Key variables in these assumptions are identified above and include the number and type of new claims to be filed each year, the average cost of disposing of each such new claim, average annual defense costs, compliance by relevant parties with the terms of the Settlement Agreements, the resolution of remaining coverage issues with insurance carriers, and the solvency risk with respect to the relevant insurance carriers. Other factors that may affect the Corporation's Asbestos Liability and ability to recover under its insurance policies include uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, reforms that may be made by state and federal courts, and the passage of state or federal tort reform legislation.

The Corporation intends to evaluate its estimated Asbestos Liability and related insurance receivables as well as the underlying assumptions on a regular basis to determine whether any adjustments to the estimates are required. Due to the uncertainties surrounding asbestos litigation and insurance, these regular reviews may result in the Corporation incurring future charges; however, the Corporation is currently unable to estimate such future charges. Adjustments, if any, to the Corporation's estimate of its recorded Asbestos Liability and/or insurance receivables could be material to operating results for the periods in which the adjustments to the liability or receivable are recorded, and to the Corporation's liquidity and consolidated financial position.

ENVIRONMENTAL

The Corporation is currently performing certain remedial actions in connection with the sale of real estate previously owned and periodically incurs costs to maintain compliance with environmental laws and regulations. Appropriate reserves have been established.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

– PART II –

ITEM 5. MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

The shares of common stock of Ampco-Pittsburgh Corporation are traded on the New York Stock Exchange (symbol AP). The Corporation paid cash dividends on common shares in every year since 1965. In June 2017, the Corporation announced that it would suspend quarterly cash dividends, beginning with the second quarter of 2017.

	2017 Per Share Common Stock Price		Dividends	2016 Per Share Common Stock Price		Dividends
Quarter	High	Low	Declared	High	Low	Declared
First	$16.80	$13.20	$ 0.09	$14.68	$8.88	$ 0.09
Second	17.05	12.40	0.00	19.22	10.38	0.00
Third	18.15	12.70	0.00	13.65	9.34	0.18
Fourth	18.40	12.20	0.00	18.25	10.22	0.09
Year	18.40	12.20	0.09	19.22	8.88	0.36

The number of registered shareholders at December 31, 2017, and 2016, equaled 385 and 392, respectively.

STOCK PERFORMANCE GRAPH

Comparison of Five Year Cumulative Total Return*

Standard & Poors 500 Index, NYSE Composite and Morningstar’s Steel Industry

Performance Results through December 2017

Assumes $100 invested at the close of trading on the last trading day preceding January 1, 2012 in Ampco-Pittsburgh Corporation common stock, Standard & Poors 500 Index, NYSE Composite Index and Morningstar’s Steel Industry group.

*Cumulative total return assumes reinvestment of dividends.

In the above graph, the Corporation has used Morningstar’s Steel Industry group for its peer comparison. The diversity of products produced by subsidiaries of the Corporation makes it difficult to match to any one product-based peer group. Although not totally comparable, the Steel Industry group was chosen because the largest percentage of the Corporation’s sales is to the global steel industry. Historical stock price performance shown on the above graph is not necessarily indicative of future price performance.

ITEM 6. SELECTED FINANCIAL DATA

Our selected financial data includes the results of operations of Åkers AB and certain of its affiliates from March 3, 2016, and ASW Steel Inc. from November 1, 2016, their respective dates of acquisition, and their financial position beginning as of December 31, 2016. Accordingly, our selected data for 2017 and 2016 is not fully comparable to earlier years and may not be indicative of our future results of operations or financial position. The information set forth below should be read in conjunction with Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Item 8, "Financial Statements and Supplementary Data" and notes thereto.

	Year Ended December 31,				
(dollars, except per share amounts, and shares outstanding in thousands)	2017	2016	2015	2014	2013
Net sales	$432,401	$331,866	$238,480	$272,858	$281,050
Net (loss) income attributable to Ampco-Pittsburgh[1]	(12,089)	(79,820)	1,373	(1,187)	12,437
Total assets	565,599	565,889	506,156	536,409	502,673
Long-term obligations	46,818	25,389	0	0	0
Ampco-Pittsburgh shareholders' equity	158,941	147,918	211,423	205,148	234,995
Net (loss) income per common share attributable to Ampco-Pittsburgh:					
Basic[1]	(0.98)	(6.68)	0.13	(0.11)	1.20
Diluted	(0.98)	(6.68)	0.13	(0.11)	1.20
Per common share:					
Cash dividends declared	0.09	0.36	0.72	0.72	0.72
Ampco-Pittsburgh shareholders' equity	12.86	12.05	20.25	19.68	22.65
Market price at year end	12.40	16.75	10.26	19.25	19.45
Weighted average common shares outstanding	12,330	11,951	10,435	10,405	10,358
Number of registered shareholders	385	392	373	400	423
Number of employees	1,943	1,915	1,027	1,076	1,109

(1) Net (loss) income attributable to Ampco-Pittsburgh and net (loss) income per common share (basic) attributable to Ampco-Pittsburgh includes:

2016 – After-tax charges of $26,676 or $2.23 per common share principally for the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired (see Note 2 to Consolidated Financial Statements), $30,405 or $2.54 per common share to recognize a valuation allowance against certain deferred income tax assets (see Note 15 to Consolidated Financial Statements), and $4,565 or $0.38 per common share for estimated costs of asbestos-related litigation through 2026, net of estimated insurance recoveries (see Note 19 to Consolidated Financial Statements), and a settlement with an insurance carrier for an amount in excess of the receivable estimated.

2015 – After-tax asbestos-related proceeds of $9,316 or $0.89 per common share received from two insurance carriers in rehabilitation.

2014 – An after-tax charge of $2,916 or $0.28 per common share for estimated costs of asbestos-related litigation through 2024, net of estimated insurance recoveries.

2013 – An after-tax credit of $10,621 or $1.03 per common share for estimated additional insurance recoveries expected to be available to satisfy the Asbestos Liability through 2022, resulting from settlement agreements reached with various insurance carriers, offset by an after-tax charge of $4,165 or $0.40 per common share to recognize an other-than-temporary impairment of our investment in a forged roll joint venture company for a net increase to net income of $6,456 or $0.63 per common share.

ITEM 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION

(in thousands, except per share amounts)

EXECUTIVE OVERVIEW

Ampco-Pittsburgh Corporation and its subsidiaries (the “Corporation”) manufacture and sell highly engineered, high-performance specialty metal products and customized equipment utilized by industry throughout the world. We operate in two business segments – the Forged and Cast Engineered Products segment and the Air and Liquid Processing segment.

Forged and Cast Engineered Products

The Forged and Cast Engineered Products segment historically consisted of Union Electric Steel Corporation (“Union Electric Steel” or “UES”) and Union Electric Steel UK Limited (“UES-UK”). In March 2016, UES acquired the stock of Åkers AB and certain of its affiliated companies, including Åkers AB’s 60% equity interest in a Chinese joint venture company (collectively, “Åkers”). Åkers has been a leader in the production of forged and cast rolls since 1806. Collectively doing business as Union Electric Åkers, this portion of the segment produces forged hardened steel rolls used mainly for cold rolling by producers of steel, aluminum and other metals and cast rolls for hot and cold strip mills, medium/heavy section mills and plate mills in a variety of iron and steel qualities.

The segment also produces ingot and open-die forged products (“forged engineered products”) which are used in the oil and gas industry and the aluminum and plastic extrusion industries. In July 2015, UES acquired the assets of Alloys Unlimited & Processing, Inc. (“AUP”) and, in November 2016, the stock of ASW Steel Inc. (“ASW”). AUP is a supplier of specialty tool, alloy, and carbon steel round bar and is located in the United States. ASW is a specialty steel producer based in Canada. Both acquisitions support our diversification efforts in the open-die forging market.

The segment has operations in the United States, England, Sweden, Slovenia, Canada and an equity interest in three joint venture companies in China. Collectively, the segment primarily competes with European, Asian and North and South American companies in both domestic and foreign markets and distributes a significant portion of its products through sales offices located throughout the world. The consolidated financial statements of the Corporation include the results of operations of the acquired companies from their respective dates of acquisition.

The Forged and Cast Engineered Products segment had been operating at levels significantly below capacity and, in April 2017, we temporarily idled a portion of one of our cast rolls plants. While it is anticipated that market conditions in the United States, Europe and other world regions will remain difficult, protectionist acts (tariffs) and reduced output from China appear to be benefitting our two largest markets – North America and Europe. Additionally, many of our customers have announced improved financial results which should lead to additional demand and better pricing. Backlog for mill rolls has increased roughly 39% from year end 2016 to year end 2017. With respect to the oil and gas market, activity remains strong as oil and gas prices remain elevated. Backlog for forged engineered products at December 31, 2017, has nearly tripled from the prior year.

Air and Liquid Processing

The Air and Liquid Processing segment includes Aerofin, Buffalo Air Handling and Buffalo Pumps, all divisions of Air & Liquid Systems Corporation (“Air & Liquid”), a wholly owned subsidiary of the Corporation. Aerofin produces custom-engineered finned tube heat exchange coils and related heat transfer products for a variety of industries including OEM/commercial, nuclear power generation and industrial manufacturing. Buffalo Air Handling produces large custom-designed air handling systems for institutional (e.g., hospital, university), pharmaceutical and general industrial building markets. Buffalo Pumps manufactures centrifugal pumps for the fossil-fuel power generation, marine defense and industrial refrigeration industries. The segment has operations in Virginia and New York with headquarters in Carnegie, Pennsylvania. The segment distributes a significant portion of its products through a common independent group of sales offices located throughout the United States and Canada.

For the Air and Liquid Processing segment, business activity in the specialty centrifugal pump industry has been negatively impacted by a decline in activity in the fossil-fueled power generation market, partially offset by increased activity in the marine defense market. For the heat exchanger business, there are early signs of growth in the OEM/commercial, nuclear power generation and industrial markets. Additionally, demand for custom air handling systems continues to improve although competitive pricing pressures remain. The focus for this segment is to grow revenues, increase margins, strengthen engineering and manufacturing capabilities, and continuing to improve the sales distribution network.

CONSOLIDATED RESULTS OF OPERATIONS OVERVIEW

The Corporation

	2017		2016		2015	
Net Sales:						
Forged and Cast Engineered Products	$344,529	80 %	$247,652	75 %	$152,267	64 %
Air and Liquid Processing	87,872	20 %	84,214	25 %	86,213	36 %
Consolidated	$432,401	100%	$331,866	100%	$238,480	100%
(Loss) Income from Operations:						
Forged and Cast Engineered Products(1)	$(1,826)		$(42,878)		$(3,444)	
Air and Liquid Processing(2)	10,427		5,123		23,166	
Corporate costs	(17,970)		(16,775)		(14,675)	
Consolidated	$(9,369)		$(54,530)		$5,047	
Backlog:						
Forged and Cast Engineered Products	$285,941	88 %	$196,512	84 %	$106,582	75 %
Air and Liquid Processing	40,438	12 %	37,078	16 %	35,243	25 %
Consolidated	$326,379	100%	$233,590	100%	$141,825	100%

(1) (Loss) income from operations for the Forged and Cast Engineered Products segment for 2016 includes a pre-tax charge of $26,676 principally for the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired (see Note 2 to Consolidated Financial Statements).

(2) (Loss) income from operations for the Air and Liquid Processing segment includes: for 2016, a net pre-tax charge of $4,565 for estimated costs of asbestos-related litigation through 2026, net of estimated insurance recoveries (see Note 19 to Consolidated Financial Statements), and a settlement with an insurance carrier for an amount in excess of the receivable estimated; and, for 2015, a pre-tax credit of $14,333 for asbestos-related proceeds received from two insurance carriers in rehabilitation.

Consolidated net sales for 2017 increased from 2016 principally due to higher sales for the Forged and Cast Engineered Products segment. Specifically, sales of forged engineered products for the oil and gas industry improved by approximately $73,000, of which approximately $38,000 represents the estimated full year effect of the ASW acquisition, which took place in November 2016. Sales of mill rolls to the steel industry increased by approximately $24,000. Sales for the Air and Liquid Processing segment also improved when compared to a year ago. The increase in net sales in 2016, when compared to 2015, is primarily the result of the acquisition of Åkers and ASW, which had net sales, from their respective dates of acquisition, of $128,602.

Consolidated (loss) income from operations for 2016 includes a pre-tax charge of $26,676 for the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired and, for our Air and Liquid Processing segment, a net pre-tax charge of $4,565 for the estimated costs of asbestos-related litigation through 2026, net of estimated insurance recoveries, and a settlement with an insurance carrier in excess of the receivable amount estimated. By comparison, consolidated (loss) income from operations for 2015 includes pre-tax asbestos-related proceeds of $14,333 received from two insurance carriers in rehabilitation. Higher operating losses for Åkers, including integration-related restructuring costs and unfavorable effects from purchase accounting, further impacted 2016 operating results. Corporate expenses increased in the current year due to higher employee-related costs and professional fees, offset by lower acquisition-related costs. The increase in corporate expenses in 2016, when compared to 2015, is attributable to including a full year effect of centralizing the back office functions, which transferred approximately $800 of additional costs from the operating entities to Corporate, and higher professional fees, resulting primarily from the acquisition of Åkers and ASW. Acquisition-related costs approximated $3,056 and $3,383 in 2016 and 2015, respectively.

A discussion of sales, (loss) income from operations and backlog for the Corporation’s two segments is included below.

Gross margin, excluding depreciation and amortization, as a percentage of net sales, was 17.3%, 16.7% and 17.8% for 2017, 2016 and 2015, respectively. The decrease in 2016, when compared to 2017 and 2015, is principally due to the acquisition of Åkers and unfavorable effects from purchase accounting.

Selling and administrative expenses totaled $61,310 (14.2% of net sales), $58,175 (17.5% of net sales) and $39,510 (16.6% of net sales) for 2017, 2016 and 2015, respectively. The net increase in 2017, as compared to 2016, is principally due to higher commission charges of $1,680, associated with the increase in the volume of shipments, and higher corporate expenses of $1,195, offset by subsequent proceeds of $1,322 received in the current year related to a customer who had filed for bankruptcy in 2016. While the current year includes a full-year effect of the acquisitions, the prior year includes acquisition-related costs of $3,056 and a reserve of $1,513 against the receivable from the customer who filed for bankruptcy protection. The increase for 2016, versus 2015, is primarily due selling and administrative expenses of Åkers and ASW, which approximated $17,145, including the reserve of $1,513 related to the receivable from a customer who had filed for Chapter 11 bankruptcy protection, and higher corporate expenses. Acquisition-related costs for 2016 and 2015 were comparable.

The charge for asbestos litigation in 2016 represents an extension of the estimated costs of pending and future asbestos claims, net of additional insurance recoveries, from 2024 to the end of 2026, partly offset by asbestos-related proceeds received from a settlement with an insurance carrier in excess of the amount estimated and included as an insurance receivable. The credit for asbestos litigation in 2015 represents asbestos-related proceeds received from two insurance carriers in rehabilitation which, because of their potential insolvency, were not included in the insurance receivable previously recorded. See Note 19 to Consolidated Financial Statements.

The charges for impairment in 2016 represent primarily the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired. Goodwill is not amortized but is tested for impairment at the reporting unit level at least annually, as of October 1, or whenever events and circumstances indicate the carrying amount may not be recoverable. In connection with our strategic planning process and goodwill impairment testing completed in the fourth quarter of 2016, we determined that goodwill in the Forged and Cast Engineered Products reporting unit was fully impaired, primarily as a result of depressed market conditions.

Interest expense for the current year continued to increase, when compared to the prior years, principally as a result of a full year effect of interest and related costs on the: (i) notes issued in 2016 in connection with the purchase of Åkers; (ii) loan payable to the non-controlling shareholder of the Åkers Chinese joint venture; and (iii) revolving credit facility, which was entered into in May 2016. Additionally, in 2017, we incurred interest, fees and early termination costs associated with extinguishing ASW’s outstanding credit facility and term loan.

On December 22, 2017, the U.S. federal government enacted the Tax Cuts and Jobs Act (the “Tax Reform”), to become effective as of January 1, 2018, which, among other things, lowered the U.S. corporate statutory income tax rate from 35% to 21%, implemented a modified territorial tax system and imposed a one-time tax on deemed repatriated earnings of foreign subsidiaries. The Tax Reform negatively impacted our income tax provision by approximately $1,565, principally related to the one-time repatriation transition tax offset by income tax benefits resulting from 100% bonus depreciation. There was no cash outlay due to the Tax Reform, however, it reduced the amount of our carryback refund that we would have been able to receive. Additionally, there was no significant impact from remeasuring our U.S. deferred income tax assets and liabilities at the new enacted statutory income tax rate since these net deferred income tax assets are fully valued. We will continue to analyze the Tax Reform and refine our provisional amounts, which could potentially impact the measurement of our tax balances.

In response to the enacted Tax Reform, Staff Accounting Bulletin No. 118 (SAB 118) was issued to address the application of U.S. Generally Accepted Accounting Principles in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform. As of December 31, 2017, in accordance with SAB 118, we made a reasonable estimate of the: (i) one-time repatriation transition tax; (ii) increased bonus depreciation for assets placed in service on or after September 27, 2017; and (iii) effects on our existing deferred tax balances, but have not completed our full accounting for the tax effects of enactment of the Tax Reform. We anticipate U.S. regulatory agencies will issue further regulations during 2018, which may alter this estimate. We are continuing to analyze our earnings and profits in foreign jurisdictions and our deferred tax balances.

In January 2018, the Financial Accounting Standards Board (“FASB”) released guidance on the accounting for tax on the global intangible low-taxed income (“GILTI”) provisions of the Tax Reform. The GILTI provisions impose a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The guidance indicates that either accounting for deferred taxes related to GILTI inclusions or to treating any taxes on GILTI inclusions as period cost are both acceptable methods, subject to an accounting policy election. We are still evaluating the GILTI provisions and have not yet elected an accounting policy for GILTI. The final determination of the tax effects of enactment of the Tax Reform will be completed within the measurement period of up to one year from the enactment date as permitted by SAB 118, and any adjustments to provisional amounts that are identified during the measurement period will be recorded in the reporting period in which the adjustment is determined.

For 2016, our income tax provision includes valuation allowances against certain of our deferred income tax assets. To determine whether a valuation allowance was needed, we assessed available positive and negative evidence and estimated whether sufficient future taxable income would be generated to permit use of the existing deferred income tax assets. However, during 2016, we incurred three years of cumulative losses, inclusive of the acquired Åkers businesses as if the businesses were held during the entire three-year period. Such objective evidence limits our ability to consider other subjective evidence, such as projections for future growth and profitability. On the basis of this evaluation, we established valuation allowances of $30,405 to reduce the estimated portion of deferred income tax assets to an amount that is “more likely than not” to be realized. The valuation allowance is a non-cash charge and the deferred income tax assets remain available to offset future income tax payments. Additionally, if and when we return to a level of sustained profitability sufficient to conclude that it is more likely than not that deferred income tax assets will be realized, we will reduce the valuation allowance accordingly.

Prior to the Tax Reform, our U.S. corporate statutory income tax rate equaled 35%. The effective income tax rate for 2016 is higher than our corporate statutory income tax rate principally due to the recognition of valuation allowances against certain of our deferred income tax assets and the write-off of goodwill, which is non-deductible for tax purposes until the associated entities are sold. The effective income tax rate for 2015 is higher than our corporate statutory income tax rate due to the non-deductibility of acquisition-related costs, state income taxes and a lower statutory income tax rate in jurisdictions where foreign operations incurred a net loss (thereby generating less of a tax benefit).

In 2016, Union Electric Steel sold a portion of its interest in Union Electric Steel MG Roll Co., Ltd., and, as part of that transaction, the joint venture company was renamed Masteel Gongchang Roll Co., Ltd. (“MG”). Certain proceeds are being recognized when received since, at the time of the sale, collectability was not assured. Additionally, as a result of the sale, we re-evaluated our ability to exercise significant influence over the joint venture and determined that we no longer were able to exercise such influence. Accordingly, equity gains (losses) in joint venture for 2017 represent principally proceeds received from the sale of the equity interest. For 2016, equity gains (losses) in joint venture represent the gain on the sale of the equity interest in MG and Union Electric Steel’s share of earnings of MG and, for 2015, its share of losses. See Note 3 to Consolidated Financial Statements.

As a result of the above, for 2017, we incurred a net loss of $12,089, or $0.98 per common share. For 2016, we incurred a net loss of $79,820, or $6.68 per common share, which includes after-tax charges of $26,676, or $2.23 per common share, principally for the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired; $30,405, or $2.54 per common share, for valuation allowances established against certain of our deferred income tax assets; and $4,565, or $0.38 per common share, for estimated costs of asbestos-related litigation through 2026, net of estimated insurance recoveries estimated and a settlement with an insurance carrier for an amount in excess of the receivable estimated. For 2015, we earned $1,373, or $0.13 per common share, which includes an after-tax credit of $9,316, or $0.89 per common share, for the net benefit of proceeds received from insurance carriers in rehabilitation.

Forged and Cast Engineered Products

	2017	2016	2015
Net sales	$344,529	$247,652	$152,267
Operating loss	$(1,826)	$(42,878)	$(3,444)
Backlog	$285,941	$196,512	$106,582

Net sales for 2017 increased from the prior year as a result of higher shipments for each of the segment’s product lines. Net sales of forged engineered products contributed $73,000 of additional sales of which approximately $38,000 represents the estimated full year effect of the ASW acquisition in November 2016, with the balance due to improved demand as a result of elevated pricing in the oil and gas market. Sales of forged and cast mill rolls improved by $11,000 and $13,000, respectively, principally on a higher volume of shipments, both domestically and abroad. Changes in exchange rates used to translate sales and operating results of our foreign operations to the U.S. dollar did not have a significant effect on comparability between 2017 and 2016.

Net sales for 2016 include the net sales of Åkers and ASW from their respective dates of acquisition, or $128,602. Net sales of legacy businesses decreased from 2015 primarily as a result of a decline in traditional roll shipments of

$15,015 and forged engineered products of $13,170. Additionally, the exchange rate used to translate sales of our U.K. operations from the British pound to the U.S. dollar reduced 2016 net sales by approximately $5,032 when compared to 2015; the impact on operating results, however, was not significant.

Operating results for 2017 improved from a year ago, which includes the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired of approximately $26,676 and integration-related restructuring expenses. Operating results for the current year principally benefited from the higher volume of shipments (approximately $11,000) and a full-year of contribution from ASW including proceeds received for a customer who filed for bankruptcy protection in 2016 (combined, approximately $5,400). While margins improved from better pricing, unfavorable absorption associated with the temporary idling of one of our cast roll facilities and higher operating and raw material costs minimized the contribution to operating results. Additionally, freight and commissions exceeded the prior year (approximately $3,400) on the higher volume of shipments.

Operating results for 2016 includes the operating results of Åkers and ASW of approximately $(37,207), including the write-off of goodwill, and the incurrence of integration-related expenses and unfavorable effects from purchase accounting. In addition, when compared to 2015, operating results for 2016 were also affected by weaker margins on shipments of our forged and cast mill rolls and forged engineered products by our legacy businesses of $3,003. While our operating results for 2016 were further impacted by a lower volume of shipments of cast rolls and forged engineered products, the effect on operating results was offset by a higher volume of forged roll shipments.

Backlog at December 31, 2017, increased from the prior year due to improved demand for mill rolls, both forged and cast, and forged engineered products. Of the increase in backlog, approximately 80% is attributable to mill rolls and 20% to forged engineered products. The majority of the increase in backlog at December 31, 2016, from 2015, is due to the inclusion of backlog for Åkers and ASW, or $88,590. As of December 31, 2017, approximately $20,318 of the backlog is expected to be released after 2018.

Air and Liquid Processing

	2017	2016	2015
Net sales	$87,872	$84,214	$86,213
Operating income	$10,427	$5,123	$23,166
Backlog	$40,438	$37,078	$35,243

Net sales for the segment were higher in 2017, when compared to the prior two years. Specifically, sales of air handling systems continued to improve, 14% over the two-year period, as a result our market share growth, principally in the hospital and pharmaceutical industries. While sales of centrifugal pumps fell slightly in the current year, sales over the two-year period grew by a net 8%, principally due to an increase in shipments to U.S. Navy shipbuilders offset by a decrease in commercial pump shipments. Sales of heat exchange coils rose slightly in the current year on additional sales to the nuclear industry; however, sales are approximately 11% less than 2015 due to a reduced level of shipments to the fossil-fueled utility, industrial and OEM/commercial markets resulting from lower demand and increased competition.

Operating income for 2016 and 2015 includes asbestos-related items. For 2016, operating income includes a pre-tax charge of $5,632 for estimated costs of asbestos-related litigation through 2026, net of estimated insurance recoveries, offset by proceeds received of $1,067 from an asbestos-related insurance carrier greater than the receivable estimated. For 2015, operating income includes $14,333 of proceeds received from two insurance carriers in rehabilitation which, because of their potential insolvency, were not included in the insurance receivable previously recorded. Otherwise, operating income for 2017 and 2016 benefited principally from a better product mix and cost containment efforts.

Backlog at the end of 2017 improved from 2016 and 2015 as a result of a higher level of orders for U.S. Navy shipbuilders. Year-end backlog for air handling units was comparable to a year ago and better than 2015 due to improved market demand. Backlog for heat exchange coils continued to decrease from the previous two years primarily due to a decline in orders for the fossil-fueled utility, industrial and OEM/commercial markets. The majority of the year-end backlog is scheduled to ship in 2018.

LIQUIDITY AND CAPITAL RESOURCES

Net cash flows (used in) provided by operating activities for 2017 equaled $(15,839) compared to $(5,634) and $20,505 for 2016 and 2015, respectively. The increase in cash used for operating activities in 2017, when compared to 2016, is primarily due to our investment in trade working capital as a result of the growth in the mill roll and forged engineered product businesses during the year and anticipated in 2018. Cash flows for the current year benefitted from U.S. federal and state income tax refunds of $6,540. The increase in cash used for operating activities in 2016, when compared to 2015, is principally due to a net loss being incurred in 2016 whereas 2015 was profitable.

In 2016, we recognized non-cash charges for: (i) the write-off of goodwill in the Forged and Cast Engineered Products reporting unit deemed to be impaired; (ii) valuation allowances to reduce our deferred income tax assets to an amount that is “more likely than not” to be realized; and (iii) the revaluation of our Asbestos Liability and insurance receivables. While these non-cash charges impacted earnings, they did not affect cash flows by the same amount. Instead, since goodwill represents the excess of the purchase price of a business over the fair value of net tangible and intangible assets acquired and liabilities assumed, cash flow is affected at the time the consideration is paid. Additionally, the deferred income tax assets remain available to offset future income tax payments. Finally, the Asbestos Liability, net of insurance recoveries, will be paid over a number of years and will generate tax benefits. Net asbestos-related payments equaled $5,828, $4,630 and $3,971 in 2017, 2016 and 2015, respectively, and are expected to approximate $5,000 in 2018. In 2016, we received proceeds of $1,067 from a settlement with an insurance carrier for asbestos liabilities in excess of the receivable amount estimated and, in 2015, proceeds of $14,333 from two insurance carriers in rehabilitation.

Net cash flows used in investing activities were $13,181, $40,878 and $14,299 in 2017, 2016 and 2015, respectively. The cash portion of the purchase price, net of cash acquired, approximated $27,031 and $3,265 for Åkers and ASW, respectively. The purchase of AUP in 2015 approximated $5,000. During 2017, Union Electric Steel received proceeds of $1,500 from the sale of a portion of its interest in MG; certain proceeds are being recognized when received since, at the time of the sale, collectability was not assured. The majority of the capital expenditures are for our Forged and Cast Engineered Products segment and, as of December 31, 2017, expected future capital expenditures approximated $4,000, which are anticipated to be spent over the next 12-18 months.

Net cash outflows provided by (used in) financing activities improved in 2017, when compared to 2016 and 2015. During the current year, we borrowed $20,349, net, under our revolving credit facility, which exceeded the cash requirements to pay off the net borrowings (term debt and credit facility) assumed as part of the ASW acquisition. In June 2017, we announced that we would suspend quarterly cash dividends, beginning with the second quarter of 2017. Accordingly, dividends paid in 2017 equaled $0.18 per common share (including $0.09 per common share for dividends declared in 2016 but paid in 2017) versus $0.36 per common share in 2016 and $0.72 per common share in 2015.

The effect of exchange rate changes on cash and cash equivalents is primarily attributable to the fluctuation of the British pound and Swedish krona against the U.S. dollar.

As a result of the above, cash and cash equivalents decreased by $17,879 in 2017 and ended the year at $20,700, in comparison to $38,579 and $95,122 at December 31, 2016, and 2015, respectively. Cash held by our foreign operations equaled $15,809, $12,539 and $10,785 at December 31, 2017, 2016 and 2015, respectively. Under the Tax Reform, future distributions of non-U.S. assets to the U.S. will no longer be subject to U.S. taxation; however, local and withholding taxes may continue to apply. The cash held by our foreign operations is considered to be permanently reinvested; accordingly, a provision for estimated local and withholding tax has not been made. If we were to remit any foreign earnings to the U.S., the estimated tax impact would be insignificant.

We have sufficient net operating loss carryforwards available to offset any cash payments that would otherwise be required under the Tax Reform; accordingly, the repatriation transition tax is not currently expected to have a significant impact on our cash resources. Funds on hand, funds generated from future operations and availability under our revolving credit facility (approximately $56,000 at December 31, 2017, which remained undrawn) are expected to be sufficient to finance our operational and capital expenditure requirements. While the revolving credit facility limits the amount of distributions upstream, we have not historically relied on or have been dependent on distributions from our subsidiaries and are not expected to be in the future. Additionally, we had approximately $800 (£250 in the United Kingdom and €400 in Belgium) available under short-term lines of credit at December 31, 2017.

We had the following contractual obligations outstanding as of December 31, 2017:

	Payments Due by Period					
	Total	<1 year	1–3 years	3–5 years	>5 years	Other
Debt(1)	$61,604	$5,325	$26,739	$20,349	$9,191	$ 0
Fixed Rate Interest(2)	4,763	34	4,727	2	0	0
Capital Lease Obligations	1,773	699	793	281	0	0
Operating Lease Obligations	3,718	702	1,152	962	902	0
Capital Expenditures	3,944	0	3,944	0	0	0
Pension and Other Postretirement Benefit Obligations(3)	53,829	4,206	15,560	16,222	17,841	0
Purchase Obligations(4)	3,110	2,200	905	5	0	0
Unrecognized Tax Benefits(5)	117	117	0	0	0	0
Total	$132,858	$13,283	$53,820	$37,821	$27,934	$ 0

(1) Represents principal only. Our revolving credit facility terminates in 2021. Borrowings outstanding at year end have been reflected accordingly; however, given the nature of the facility, borrowings may be repaid earlier.

Additionally, although the Industrial Revenue Bonds (IRBs) begin to mature in 2020, the IRBs are remarketed periodically. If the IRBs are not able to be remarketed, the bondholders can put back the bonds to the Corporation and seek reimbursement from letters of credit which serve as collateral for the bonds. See Note 8 to Consolidated Financial Statements.

(2) Represents fixed rate interest only, principally due on the promissory notes. Variable interest rates averaged less than 3% in the current year. See Note 8 to Consolidated Financial Statements.

(3) Represents estimated contributions to our pension and other postretirement plans. Actual required contributions are contingent on a number of variables, including future investment performance of the plans' assets and may differ from these estimates. Contributions to the U.S. defined benefit plans are based on the projected funded status of the plans including anticipated normal costs, amortization of unfunded liabilities and an expected return on plan assets ranging between 6.95% and 7.50%. With respect to the U.K. defined benefit plan, the Trustees and UES-UK have agreed to a recovery plan that estimates the amount of employer contributions, based on U.K. regulations, necessary to eliminate the funding deficit of the plan over an agreed period. Our other foreign plans are unfunded. See Note 9 to Consolidated Financial Statements.

(4) Includes commitments by one of our Forged and Cast Engineered Products subsidiaries for the purchase of natural gas for 2018 covering approximately 62% of anticipated needs (see Note 13 to Consolidated Financial Statements) and commitments for scrap and alloys.

(5) Represents uncertain tax positions. See Note 15 to Consolidated Financial Statements.

With respect to environmental matters, we are currently performing certain remedial actions in connection with the sale of real estate previously owned and periodically incur costs to maintain compliance with environmental laws and regulations. Environmental exposures are difficult to assess and estimate for numerous reasons, including lack of reliable data, the multiplicity of possible solutions, the years of remedial and monitoring activity required, and the identification of new sites. However, we believe the potential liability for remedial actions and environmental compliance measures of approximately $440 accrued at December 31, 2017, is considered adequate based on information known to date (see Note 20 to Consolidated Financial Statements).

The nature and scope of our business brings us into regular contact with a variety of persons, businesses and government agencies in the ordinary course of business. Consequently, we and certain of our subsidiaries from time to time are named in various legal actions. Generally, we do not anticipate that our financial condition or liquidity will be materially affected by the costs of known, pending or threatened litigation (see Note 19 to Consolidated Financial Statements). However, claims have been asserted, principally against Air & Liquid, alleging personal injury from exposure to asbestos-containing components historically used in some products and there can be no assurance that future claims will not present significantly greater and longer lasting financial exposure than presently contemplated.

OFF-BALANCE SHEET ARRANGEMENTS

Our off-balance sheet arrangements include operating leases, capital expenditures and purchase obligations disclosed in the contractual obligations table, and letters of credit unrelated to the Industrial Revenue Bonds, as discussed in Note 10 to the Consolidated Financial Statements. These arrangements are not considered significant to our liquidity, capital resources, market risk or credit risk.

EFFECTS OF INFLATION

While inflationary and market pressures on costs are likely to be experienced, it is anticipated that ongoing improvements in manufacturing efficiencies and cost savings efforts will mitigate the effects of inflation on 2018 operating results. The ability to pass on increases in the price of commodities to the customer is contingent upon current market conditions, with us potentially having to absorb some portion to all of the increase. Product pricing for the Forged and Cast Engineered Products segment is reflective of current costs, with a portion of orders subject to a variable-index surcharge program which helps to protect the segment and its customers against the volatility in the cost of certain raw materials. Additionally, long-term labor agreements exist at each of the key locations. Although one of these agreements expired in 2017, employees continue to work under the expired agreement while negotiations proceed. Additionally, other agreements expire in 2018. As is consistent with past practice, we will negotiate with the intent to secure mutually beneficial arrangements covering multiple years (see Note 10 to Consolidated Financial Statements). Finally, commitments have been executed for natural gas usage and certain commodities (copper and aluminum) to cover a portion of orders in the backlog (see Note 13 to Consolidated Financial Statements).

APPLICATION OF CRITICAL ACCOUNTING POLICIES

We have identified critical accounting policies that are important to the presentation of our financial condition, changes in financial condition and results of operations and involve the most complex or subjective assessments. Critical accounting policies relate to assessing recoverability of property, plant and equipment and accounting for business combinations (including intangibles and goodwill and the recoverability thereof), pension and other postretirement benefits, litigation and loss contingencies, and income taxes.

Property, plant and equipment is reviewed for recoverability whenever events or circumstances indicate the carrying amount of the long-lived assets may not be recoverable. If the undiscounted cash flows generated from the use and eventual disposition of the assets are less than their carrying value, then the asset value may not be fully recoverable potentially resulting in a write-down of the asset value. Estimates of future cash flows are based on expected market conditions over the remaining useful life of the primary asset(s). Accordingly, assumptions are made about pricing, volume and asset-resale values. Actual results may differ from these assumptions. We believe the amounts recorded in the accompanying consolidated financial statements for property, plant and equipment are recoverable and are not impaired as of December 31, 2017.

Business combinations are accounted for under the purchase method of accounting. Accordingly, the amount paid for an acquisition is initially allocated to the tangible assets acquired and liabilities assumed based on their estimated fair values as of the date of acquisition. The purchase price in excess of net tangible assets acquire is then allocated to identifiable intangible assets based on detailed valuations. Any excess purchase price over the fair value of the net tangible and intangible assets acquired and liabilities assumed is allocated to goodwill.

Significant judgments and assumptions are required in determining the estimated fair value of assets acquired and liabilities assumed. We utilize third-party valuation specialists and actuaries to assist in determining the fair value of assets acquired and liabilities assumed based on information and assumptions provided by us. The valuation of purchased intangible assets is based upon estimates of future performance and cash flows of the acquired business. Each asset is measured at fair value from the perspective of a market participant. The valuation of employee benefit obligations is consistent with the critical accounting policy outlined below. Significant business and valuation assumptions used in the purchase price allocation include, but are not limited to, the valuation methodology, projected revenues and expenses and related growth rates, and discount rates. If different assumptions are used, it could materially impact the estimated fair values of assets acquired and liabilities assumed. Additionally, initial estimates of the fair value of assets acquired and liabilities assumed are provisional and could change as additional information is received. We finalize our valuations as soon as practicable, but not later than one year from the date of acquisition.

Intangible assets with definite lives are amortized using the straight-line method over their estimated useful life, which is determined by identifying the period over which most of the cash flows are expected to be generated. Additionally, intangible assets, both definite and indefinite lived, are assessed for impairment at least annually, as of October 1, or whenever events or circumstances indicate the carrying amount may not be recoverable. If the undiscounted cash flows attributable to the assets are less than their carrying value, then the asset value may not be fully recoverable potentially resulting in a write-down of the asset value. In assessing recoverability, we make assumptions regarding estimated future cash flows and discount rates. If these estimates or related assumptions change in the future, we may be required to record an impairment charge. Also, if the estimate of an intangible asset’s remaining useful life changes, we will amortize the remaining carrying value of the intangible asset prospectively over the revised remaining useful life. We believe the amounts recorded in the accompanying consolidated financial statements for intangible assets are recoverable and are not impaired as of December 31, 2017.

See Note 2 to the Consolidated Financial Statements.

Accounting for pension and other postretirement benefits involves estimating the cost of benefits to be provided well into the future and attributing that cost over the time period each employee works. To accomplish this, input from our actuaries is evaluated and extensive use is made of assumptions about inflation, long-term rate of return on plan assets, longevity, rates of increases in compensation, employee turnover and discount rates. The curtailment of various U.S. defined benefit plans and amendment of various other postretirement benefit plans in 2016 will help to mitigate the volatility in net periodic pension and other postretirement benefit costs resulting from changes in these assumptions.

The expected long-term rate of return on plan assets is an estimate of average rates of earnings expected to be earned on funds invested or to be invested to provide for the benefits included in the projected benefit obligation. Since these benefits will be paid over many years, the expected long-term rate of return is reflective of current investment returns and investment returns over a longer period. Also, consideration is given to target and actual asset allocations, inflation and real risk-free return. We believe the expected long-term rate of return ranging between 6.95% and 7.50% for our domestic plans and 4.45% for our UES-UK plan to be reasonable. Actual returns on plan assets for 2017 approximated 14.38% for our domestic plans and 7.68% for our UES-UK plan. The remaining foreign plans are not funded and the obligations are not significant.

The discount rates used in determining future pension obligations and other postretirement benefits for each of our plans are based on rates of return for high-quality fixed-income investments currently available and expected to be available during the period to maturity of pension and other postretirement benefits. High-quality fixed-income investments are defined as those investments which have received one of the two highest ratings given by a recognized rating agency with maturities of 10+ years. We believe the assumed discount rates ranging between 3.63% and 3.72% for our domestic plans, 3.46% and 3.69% for our other postretirement benefits plans and 2.45% for our foreign plans as of December 31, 2017, to be reasonable.

We believe that the amounts recorded in the accompanying consolidated financial statements related to pension and other postretirement benefits are based on appropriate assumptions although actual outcomes could differ. A percentage point decrease in the expected long-term rate of return would increase annual pension expense by approximately $2,400. A 1/4 percentage point decrease in the discount rate would increase projected and accumulated benefit obligations by approximately $11,000. Conversely, an increase in the expected long-term rate of return would decrease annual pension expense by approximately $2,400 and an increase in the discount rate would decrease projected and accumulated benefit obligations by approximately $11,000.

Litigation and loss contingency accruals are made when it is determined that it is probable that a liability has been incurred and the amount can be reasonably estimated. Specifically, we and certain of our subsidiaries are involved in various claims and lawsuits incidental to their businesses. In addition, claims have been asserted, principally against Air & Liquid, alleging personal injury from exposure to asbestos-containing components historically used in some products manufactured by certain companies which now operate as divisions of Air & Liquid. To assist us in determining whether an estimate could be made of the potential liability for pending and unasserted future claims for Asbestos Liability along with applicable insurance coverage, and the amounts of any estimates, we hire a nationally recognized asbestos-liability expert and insurance consultant. Based on their analyses, reserves for probable and reasonably estimable costs for the Asbestos Liability including defense costs and receivables for the insurance recoveries that are deemed probable are established. These amounts rely on assumptions which are based on currently known facts and strategy.

In 2016, we undertook a review of Asbestos Liability claims, defense costs and the likelihood for insurance recoveries. Key variables in these assumptions are summarized in Note 19 to the Consolidated Financial Statements and include the number and type of new claims to be filed each year, the average cost of disposing of each new claim, average annual defense costs, the resolution of coverage issues with insurance carriers, and the solvency risk with respect to the relevant insurance carriers. Other factors that may affect the Asbestos Liability and our ability to recover under our insurance policies include uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, reforms that may be made by state and federal courts, and the passage of state or federal tort reform legislation. Actual expenses or insurance recoveries could be significantly higher or lower than those recorded if assumptions used in the calculations vary significantly from actual results.

We intend to evaluate the estimated Asbestos Liability and related insurance receivables as well as the underlying assumptions on a regular basis to determine whether any adjustments to the estimates are required. Due to the uncertainties surrounding asbestos litigation and insurance, these regular reviews may result in the incurrence of future charges; however, we are currently unable to estimate such future charges. Adjustments, if any, to our estimate of recorded Asbestos Liability and/or insurance receivables could be material to our operating results for the periods in which the adjustments to the liability or receivable are recorded, and to our liquidity and consolidated financial position when such liabilities are paid.

Accounting for income taxes includes our evaluation of the underlying accounts, permanent and temporary differences, our tax filing positions and interpretations of existing tax law. A valuation allowance is recorded against deferred income tax assets to reduce them to the amount that is “more likely than not” to be realized. In doing so, assumptions are made about the future profitability of our operations and the nature of that profitability. Actual results may differ from these assumptions. If we determined we would not be able to realize all or part of the deferred income tax assets in the future, an adjustment to the valuation allowance would be established resulting in a charge to net income (loss). Likewise, if we determined we would be able to realize deferred income tax assets in excess of the net amount recorded, we would release a portion of the existing valuation allowance resulting in a credit to net income (loss). As of December 31, 2017, the valuation allowance approximates $38,112 reducing our deferred income tax assets, net of deferred income tax liabilities, to $1,157, an amount we believe is “more likely than not” to be realized.

We do not recognize a tax benefit in the financial statements related to a tax position taken or expected to be taken in a tax return unless it is “more likely than not” that the tax authorities will sustain the tax position solely on the basis of the position’s technical merits. Consideration is given primarily to legislation and statutes, legislative intent, regulations, rulings and case law as well as their applicability to the facts and circumstances of the tax position when assessing the sustainability of the tax position. In the event a tax position no longer meets the “more likely than not” criteria, we would reverse the tax benefit by recognizing a liability and recording a charge to earnings. Conversely, if we subsequently determined that a tax position meets the “more likely than not” criteria, we would recognize the tax benefit by reducing the liability and recording a credit to earnings. As of December 31, 2017, based on information known to date, we believe the amount of unrecognized tax benefits of $117 for tax positions taken or expected to be taken in a tax return which may be challenged by the tax authorities is adequate.

We have recorded provisional estimates associated with the December 2017 enactment of the Tax Reform. The SEC has provided accounting and reporting guidance that allows us to report provisional amounts within a measurement period up to one year due to the complexities inherent in adopting the changes. We consider both the recognition of the repatriation transition tax and the remeasurement of our deferred income tax assets and liabilities as incomplete.

New guidance from regulators, interpretation of the law, and refinement of our estimates from ongoing analysis of data and tax positions may change the provisional amounts. The repatriation transition tax is based on our total post-1986 foreign earnings and profits that were previously deferred from U.S. taxation. We have not yet completed our substantiation of the underlying data and therefore our taxable base estimates may change. Our estimates of foreign tax credits may also change as we substantiate tax credits claimed. Further, the repatriation transition tax is based in part on the amount of foreign earnings held in cash and other liquid assets. The repatriation transition tax may change as we more precisely calculate amounts held in liquid and illiquid assets at the various measurement dates. If the final tax outcome of these matters is different than provisional amounts, it will impact the provision for income taxes and the effective tax rate in the period recorded.

In 2017, we recognized the tax impact of including certain foreign earnings in U.S. taxable income. Additional taxes, local and withholding, may result when earnings are repatriated to the U.S. We have not recognized any additional charge for local and withholding taxes that could be incurred on any distributions of non-U.S. earnings, because such non-U.S. earnings are deemed to be permanently invested. Remittances of non-U.S. earnings are based on estimates and judgments of projected cash flow needs, as well as the working capital and investment requirements of our non-U.S. and U.S. operations. Material changes in our estimates of cash, working capital, and investment needs in various jurisdictions could require repatriation of indefinitely reinvested non-U.S. earnings, which could be subject to applicable non-U.S. income and withholding taxes, however, the amount is not expected to be significant.

See Note 15 to the Consolidated Financial Statements.

RECENTLY IMPLEMENTED ACCOUNTING PRONOUNCEMENTS

In January 2018, the FASB issued ASU 2018-02, Income Statement – Reporting Comprehensive Income, which allows for a reclassification from accumulated other comprehensive income (loss) to retained earnings for the stranded tax effects resulting from the Tax Reform. A stranded tax effect is defined as the difference in the tax effect of amounts recognized as other comprehensive income (loss) items, using the income tax rate in effect at the time of recognition and the newly enacted income tax rate. ASU 2018-02 is relevant only to the reclassification of the income tax effects of the Tax Reform; accordingly, the underlying guidance that requires that the effect of a change in tax laws or rates be included in income from continuing operations is not affected. The guidance becomes effective for interim and annual periods beginning after December 15, 2018; however, early adoption is permitted. We adopted the new guidance in our 2017 accounts and, as a result, $6,088 was reclassified between accumulated other comprehensive loss and retained earnings.

In March 2016, the FASB issued ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, which requires all income tax effects of awards to be recognized in the income statement when the awards vest or are settled. The guidance also requires presentation of excess tax benefits as an operating activity on the statement of cash flows rather than as a financing activity. The amended guidance became effective for us January 1, 2017, and did not have a significant impact on our financial position, operating results or liquidity.

In July 2015, the FASB issued ASU 2015-11, Simplifying the Measurement of Inventory, which revises the measurement of inventory at the lower of cost or market. In accordance with ASU 2015-11, an entity will measure inventory at the lower of cost and net realizable value, which is defined as the estimated selling price in the ordinary course of business less reasonably predictable costs of completion, disposal and transportation. The amendment does not apply to inventory that is measured using the last-in, first out (LIFO) method. The guidance became effective for us January 1, 2017, and did not have a significant impact on our financial position, operating results or liquidity.

RECENTLY ISSUED ACCOUNTING PRONOUNCEMENTS

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging, which amends and simplifies existing guidance to allow companies to more accurately present the economic effects of risk management activities in the financial statements. The amended guidance will be effective for interim and annual periods beginning after December 15, 2018; however, early adoption is permitted. We are currently evaluating the impact the guidance will have on our financial position and operating results. It will not, however, affect our liquidity.

In May 2017, the FASB issued ASU 2017-09, Scope of Modification Accounting, which provides guidance about which changes to the terms and conditions of a share-based payment award require an entity to apply modification accounting. The amendment will be applied prospectively to an award modified on or after the adoption date. The amended guidance will be effective for interim and annual periods beginning after December 15, 2017. The guidance will not affect our financial position, operating results and liquidity as of the date of adoption.

In March 2017, the FASB issued ASU 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, which requires an employer who offers defined benefit and postretirement benefit plans to report the service cost component of net periodic benefit cost in the same line item or items as other compensation costs arising from services rendered by employees during the period. The other components of net periodic benefit cost are required to be presented in the income statement separately from the service cost component and outside the subtotal of income from operations. The amendment also allows only for the service cost component of net periodic benefit cost to be eligible for capitalization when applicable. The amended guidance does not change the amount of net periodic benefit cost to be recognized, only where it is to be recognized in the income statement. The amended guidance becomes effective for interim and annual periods beginning after December 15, 2017, and must be applied retrospectively for the presentation of the service cost component and the other components of net periodic pension and other postretirement costs in the income statement and prospectively for capitalization of the service cost component of net periodic benefit cost in inventory. A practical expedient is available permitting employers to use the amounts disclosed in its pension and other postretirement benefit plan footnote (Note 9 to the Consolidated Financial Statements) as the estimate to apply retrospectively. The guidance will not affect our financial position or liquidity.

In August 2016, the FASB issued ASU 2016-15, Classification of Certain Cash Receipts and Cash Payments, which clarifies guidance on the classification of certain cash receipts and payments in the statement of cash flows. The amended guidance will be effective for interim and annual periods beginning after December 15, 2017. The guidance will not have a significant impact on the presentation of our cash flow statement, and it will not affect our financial position, operating results or liquidity.

In May 2016, April 2016, March 2016 and May 2014, the FASB issued ASUs 2016-12, 2016-10, 2016-08 and 2014-09, respectively, Revenue from Contracts with Customers (Topic 606), which provides a common revenue standard for U.S. GAAP and IFRS. The guidance establishes principles for reporting information about the nature, amount, timing and uncertainty of revenue and cash flows arising from a company's contracts with customers. It requires companies to apply a five-step model when recognizing revenue relating to the transfer of goods or services to customers in an amount that reflects the consideration that the company expects to be entitled to receive for those goods and services. It also requires comprehensive disclosures regarding revenue recognition. The guidance becomes effective for interim and annual periods beginning after December 15, 2017, and can be implemented on either a full or modified retrospective basis. We will use the modified retrospective method (a cumulative adjustment to our January 1, 2018 retained earnings). Based on the evaluation of our current contracts and revenue streams, we determined they will be recorded consistently under both existing generally accepted accounting principles and the new standard. Accordingly, the new guidance will not have a material effect on our financial position, operating results or liquidity. Our disclosures, however, will change significantly in response to the requirements of the new guidance.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which requires lessees to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with a term of more than one year. Accounting by lessors will remain similar to existing generally accepted accounting principles. The guidance becomes effective for us January 1, 2019. We are currently evaluating the impact the guidance will have on our financial position, operating results and liquidity.

In January 2016, the FASB issued ASU 2016-01, Recognition and Measurement of Financial Assets and Liabilities, which simplifies the accounting and disclosures related to equity investments. ASU 2016-01 will require entities to carry certain investments in equity securities at fair value with changes in fair value recorded through net income (loss) versus other comprehensive income (loss). ASU 2016-01 does not apply to investments that qualify for the equity method of accounting or to those that result in consolidation of the investee. The guidance becomes effective for interim and annual periods beginning after December 15, 2017, and must be adopted by means of a cumulative-effect adjustment to retained earnings as of the beginning of the fiscal year of adoption. At December 31, 2017, unrealized holding gains on securities approximated $600 which will be recorded as the cumulative-effect adjustment to retained earnings. Prospectively, the guidance is not expected to have a significant effect on our financial position, operating results and liquidity.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Of our primary market risk exposures, we view changes in foreign currency rates and commodity prices to be significant enough to mitigate through derivative instruments and forward purchase agreements. To manage certain foreign currency exchange exposures, our policy is to hedge a portion of our foreign currency denominated sales and receivables, primarily U.S. sales denominated in euros and U.K. sales denominated in U.S. dollars and euros. Although strengthening of the U.S. dollar could result in a lower volume of exports from the United States and at reduced margins, exports of our foreign operations may increase and gross margins might improve. Additionally, strengthening of the British pound could result in a lower volume of exports from the United Kingdom and at reduced margins; however, exports for our domestic operations may increase and gross margins might improve. A weakening of the euro, as compared to the U.S. dollar and British pound, could result in a lower volume of exports and at reduced margins.

To reduce the effect of price changes for certain of our raw materials and energy, we enter into contracts for particular commodities (copper and aluminum) and purchase a portion of our energy usage in advance. Based on estimated annual purchases, a 10% fluctuation in commodity prices (including electricity, natural gas, steel scrap and ferroalloys) would have impacted 2017 and 2016 by approximately \$14,000 and \$8,000 (or approximately \$11,000 if the Åkers and ASW acquisitions were completed as of the beginning of the year), respectively. There is no guarantee that fluctuations in commodity prices will be limited to 10%. The ability to pass on increases in the price of commodities to the customer is contingent upon current market conditions with us potentially having to absorb a portion to all of such increase. However, a sales price surcharge mechanism is in place with a portion of the customers of our Forged and Cast Engineered Products segment which helps to protect against the volatility in the cost of certain raw materials.

See also Note 13 to the Consolidated Financial Statements.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

CONSOLIDATED BALANCE SHEETS

(in thousands, except par value)	December 31, 2017	2016
Assets		
Current assets:		
Cash and cash equivalents	$20,700	$38,579
Receivables, less allowance for doubtful accounts of $962 in 2017 and $2,228 in 2016	86,623	72,233
Inventories	107,561	83,579
Insurance receivable – asbestos	13,000	13,000
Other current assets	12,363	14,073
Total current assets	240,247	221,464
Property, plant and equipment, net	214,980	214,408
Insurance receivable – asbestos	87,342	102,945
Deferred income tax assets	1,590	4,824
Investments in joint ventures	2,175	2,019
Intangible assets, net	11,021	11,601
Other noncurrent assets	8,244	8,628
Total assets	$565,599	$565,889
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable	$47,479	$37,104
Accrued payrolls and employee benefits	22,768	20,166
Debt – current portion	19,335	26,825
Asbestos liability – current portion	18,000	18,000
Other current liabilities	37,089	42,197
Total current liabilities	144,671	144,292
Employee benefit obligations	79,750	91,947
Asbestos liability	131,750	153,181
Deferred income tax liabilities	433	591
Long-term debt	46,818	25,389
Other noncurrent liabilities	416	655
Total liabilities	403,838	416,055
Commitments and contingent liabilities (Note 10)		
Shareholders' equity:		
Common stock – par value $1; authorized 20,000 shares; issued and outstanding 12,361 shares in 2017 and 12,271 shares in 2016	12,361	12,271
Additional paid-in capital	152,992	151,089
Retained earnings	38,348	45,443
Accumulated other comprehensive loss	(44,760)	(60,885)
Total Ampco-Pittsburgh shareholders' equity	158,941	147,918
Noncontrolling interest	2,820	1,916
Total shareholders' equity	161,761	149,834
Total liabilities and shareholders' equity	$565,599	$565,889

See Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF OPERATIONS

(in thousands, except per share amounts)	For The Year Ended December 31, 2017	2016	2015
Net sales	$432,401	$331,866	$238,480
Operating costs and expenses:			
Costs of products sold (excluding depreciation and amortization)	357,672	276,496	196,091
Selling and administrative	61,310	58,175	39,510
Depreciation and amortization	22,387	20,463	11,787
Charge (credit) for asbestos litigation	0	4,565	(14,333)
Charges for impairment	0	26,676	0
Loss on disposition of assets	401	21	378
	441,770	386,396	233,433
(Loss) income from operations	(9,369)	(54,530)	5,047
Other income (expense):			
Investment-related income	133	481	174
Interest expense	(3,525)	(2,397)	(226)
Other – net	(932)	(1,074)	(475)
	(4,324)	(2,990)	(527)
(Loss) income before income taxes and equity gains (losses) in joint venture	(13,693)	(57,520)	4,520
Income tax benefit (provision)	1,355	(22,712)	(2,633)
Equity gains (losses) in joint venture, including gain on sale (Note 3)	1,036	423	(514)
Net (loss) income	(11,302)	(79,809)	1,373
Less: Net income attributable to noncontrolling interest	787	11	0
Net (loss) income attributable to Ampco-Pittsburgh	$(12,089)	$(79,820)	$1,373
Net (loss) income per common share attributable to Ampco-Pittsburgh:			
Basic	$(0.98)	$(6.68)	$0.13
Diluted	$(0.98)	$(6.68)	$0.13
Weighted average number of common shares outstanding:			
Basic	12,330	11,951	10,435
Diluted	12,330	11,951	10,447

See Notes to Consolidated Financial Statements.

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CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(in thousands)	For The Year Ended December 31, 2017	2016	2015
Net (loss) income	$(11,302)	$(79,809)	$1,373
Other comprehensive income (loss), net of income tax where applicable:			
Adjustments for changes in:			
Foreign exchange translation	11,041	(14,580)	(3,967)
Unrecognized employee benefit costs (including effects of foreign currency translation)	7,299	9,397	10,713
Unrealized holding gains (losses) on marketable securities	602	405	(239)
Fair value of cash flow hedges	804	398	(475)
Reclassification adjustments for items included in net (loss) income:			
Amortization of unrecognized employee benefit costs	3,283	1,910	4,740
Realized gains from sale of marketable securities	(29)	(1,038)	(53)
Realized (gains) losses from settlement of cash flow hedges	(670)	108	435
Other comprehensive income (loss)	22,330	(3,400)	11,154
Comprehensive income (loss)	11,028	(83,209)	12,527
Less: Comprehensive income (loss) attributable to noncontrolling interest	904	(103)	0
Comprehensive income (loss) income attributable to Ampco-Pittsburgh	$10,124	$(83,106)	$12,527

See Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

(in thousands, except per share amounts)	Common Stock	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Noncontrolling Interest	Total
Balance January 1, 2015	$ 10,426	$ 127,526	$ 135,949	$ (68,753)	$ 0	$ 205,148
Stock-based compensation		1,103				1,103
Comprehensive income:						
Net income			1,373			1,373
Other comprehensive income				11,154		11,154
Comprehensive income						12,527
Issuance of common stock including excess tax benefits of $0	14	211				225
Cash dividends ($0.72 per share)			(7,580)			(7,580)
Balance, December 31, 2015	10,440	128,840	129,742	(57,599)	0	211,423
Noncontrolling interest associated with Åkers acquisition (Note 2)					2,019	2,019
Stock-based compensation		1,482				1,482
Comprehensive loss:						
Net (loss) income			(79,820)		11	(79,809)
Other comprehensive loss				(3,286)	(114)	(3,400)
Comprehensive loss					(103)	(83,209)
Issuance of common stock including excess tax benefits of $0	1,831	20,767				22,598
Cash dividends ($0.36 per share)			(4,479)			(4,479)
Balance December 31, 2016	12,271	151,089	45,443	(60,885)	1,916	149,834
Stock-based compensation		1,555				1,555
Comprehensive income:						
Net (loss) income			(12,089)		787	(11,302)
Other comprehensive income				22,213	117	22,330
Comprehensive income					904	11,028
Impact from adoption of ASU 2018-02 (Note 15)			6,088	(6,088)		0
Issuance of common stock including excess tax benefits of $0	90	348				438
Cash dividends ($0.09 per share)			(1,094)			(1,094)
Balance December 31, 2017	$ 12,361	$ 152,992	$ 38,348	$ (44,760)	$ 2,820	$ 161,761

See Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)	For The Year Ended December 31, 2017	2016	2015
Cash flows from operating activities:			
Net (loss) income	$(11,302)	$(79,809)	$1,373
Adjustments to reconcile net (loss) income to net cash flows from operating activities:			
Depreciation and amortization	22,387	20,463	11,787
Charges for impairment	0	26,676	0
Charge for asbestos litigation	0	5,631	0
Deferred income tax provision (benefit), including valuation allowance	3,177	23,407	(2,302)
Difference between pension and other postretirement expense and contributions	(1,857)	(1,948)	4,972
Stock-based compensation	2,400	2,332	1,328
Equity (gains) losses in joint venture, including gain on sale (Note 3)	(1,036)	(423)	514
Provisions for bad debts and inventories	305	2,348	862
Provision for warranties net of settlements	(413)	(1,015)	(159)
Loss on disposition of assets	401	21	378
Gain on sale of long-term marketable securities	0	(1,404)	0
Other – net	1,569	(279)	577
Changes in assets/liabilities:			
Receivables	(12,916)	5,697	9,391
Inventories	(20,359)	8,308	(4,527)
Other assets, including insurance receivable – asbestos	19,351	20,466	15,300
Accounts payable	7,818	(8,819)	(3,003)
Accrued payrolls and employee benefits	1,101	1,051	452
Other liabilities, including asbestos liability	(26,465)	(28,337)	(16,438)
Net cash flows (used in) provided by operating activities	(15,839)	(5,634)	20,505
Cash flows from investing activities:			
Purchases of property, plant and equipment	(14,899)	(10,566)	(9,407)
Purchase of Åkers AB, net of cash acquired (Note 2)	0	(27,031)	0
Purchase of ASW Steel Inc., net of cash acquired (Note 2)	0	(3,265)	0
Purchase of Alloys Unlimited & Processing, Inc. (Note 2)	0	0	(5,000)
Proceeds from sale of investment in joint venture (Note 3)	1,500	0	0
Purchases of long-term marketable securities	(109)	(4,662)	(631)
Proceeds from sale of long-term marketable securities	327	4,646	728
Other	0	0	11
Net cash flows used in investing activities	(13,181)	(40,878)	(14,299)
Cash flows from financing activities:			
Dividends paid	(2,236)	(5,206)	(7,512)
Debt issuance costs (Note 8)	0	(1,247)	0
Repayment of debt	(1,318)	(962)	0
Proceeds from Revolving Credit and Security Agreement (Note 8)	25,349	0	0
Payments on Revolving Credit and Security Agreement (Note 8)	(5,000)	0	0
Proceeds from ASW credit facility (Note 8)	8,795	9,756	0
Payments on ASW credit facility (Note 8)	(15,941)	(11,217)	0

Net cash flows provided by (used in) financing activities	9,649	(8,876)	(7,512)
Effect of exchange rate changes on cash and cash equivalents	1,492	(1,155)	(670)
Net decrease in cash and cash equivalents	(17,879)	(56,543)	(1,976)
Cash and cash equivalents at beginning of year	38,579	95,122	97,098
Cash and cash equivalents at end of year	$20,700	$38,579	$95,122
Supplemental disclosures of cash flow information:			
Income tax payments	$844	$4,404	$3,247
Interest payments	1,283	957	225
Non-cash investing activities:			
Purchases of property, plant and equipment in accounts payable	$1,068	$996	$329
Non-cash financing activities:			
Issuance of common stock to acquire net assets of Åkers (Note 2)	$0	$22,137	$0
Issuance of debt to acquire net assets of Åkers (Note 2)	0	22,619	0

See Notes to Consolidated Financial Statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(in thousands, except share and per share amounts)

Description of Business

Ampco-Pittsburgh Corporation and its subsidiaries (the “Corporation”) manufacture and sell highly engineered, high-performance specialty metal products and customized equipment utilized by industry throughout the world. It operates in two business segments, the Forged and Cast Engineered Products segment and the Air and Liquid Processing segment.

The Forged and Cast Engineered Products segment historically consisted of Union Electric Steel Corporation (“Union Electric Steel” or “UES”) and Union Electric Steel UK Limited (“UES-UK”). UES is a forged hardened steel roll producer headquartered in Carnegie, Pennsylvania, with three manufacturing facilities in Pennsylvania and one in Indiana. UES-UK is a cast roll producer located in Gateshead, England. In March 2016, UES acquired the stock of Åkers AB and certain of its affiliated companies, including Åkers AB’s 60% equity interest in a Chinese joint venture company (collectively, “Åkers”). Headquartered in Styckebruk, Sweden, Åkers has been a leader in the production of forged and cast rolls since 1806. Collectively doing business as Union Electric Åkers, this portion of the segment produces ingot and forged products and cast products that service a wide variety of industries globally. They specialize in the production of forged hardened steel rolls used mainly for cold rolling by manufacturers of steel, aluminum and other metals and cast rolls for hot and cold strip mills, medium/heavy section mills and plate mills in a variety of iron and steel qualities.

In addition, Union Electric Steel produces ingot and open-die forged products (“forged engineered products”) which are used in the oil and gas industry and the aluminum and plastic extrusion industries. In July 2015, UES acquired the assets of Alloys Unlimited & Processing, Inc. (“AUP”) and, in November 2016, the stock of ASW Steel Inc. (“ASW”). AUP is a supplier of specialty tool, alloy, and carbon steel round bar located in Ohio. ASW is a specialty steel producer based in Ontario, Canada. Both acquisitions support the Corporation’s diversification efforts in the open-die forging market.

The segment primarily competes with European, Asian and North and South American companies in both domestic and foreign markets and distributes a significant portion of its products through sales offices located throughout the world. The consolidated financial statements of the Corporation include the financial position and results of operations of the acquired companies from their respective dates of acquisition.

The Air and Liquid Processing segment includes Aerofin, Buffalo Air Handling and Buffalo Pumps, all divisions of Air & Liquid Systems Corporation (“Air & Liquid”), a wholly owned subsidiary of the Corporation. Aerofin produces custom-engineered finned tube heat exchange coils and related heat transfer products for a variety of industries including OEM/commercial, nuclear power generation and industrial process. Buffalo Air Handling produces large custom-designed air handling systems for institutional (e.g., hospital, university), pharmaceutical and general industrial building markets. Buffalo Pumps manufactures centrifugal pumps for the fossil fuel power generation, marine defense and industrial refrigeration industries. The segment has operations in Virginia and New York with headquarters in Carnegie, Pennsylvania. The segment distributes a significant portion of its products through a common independent group of sales offices located throughout the United States and Canada.

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

The Corporation’s accounting policies conform to accounting principles generally accepted in the United States of America. The preparation of financial statements in conformity with accounting principles generally accepted in the

United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to estimates and assumptions include assessing the carrying value of long-lived assets, determining the fair value of assets acquired and liabilities assumed in a business combination (including intangibles and goodwill and the recoverability thereof), valuing the assets and obligations related to employee benefit plans, accounting for loss contingencies associated with claims and lawsuits, and accounting for income taxes. Actual results could differ from those estimates. A summary of the significant accounting policies followed by the Corporation is presented below.

Consolidation

The accompanying consolidated financial statements include the assets, liabilities, revenues and expenses of all majority owned subsidiaries and joint ventures over which the Corporation exercises control and, when applicable, entities for which the Corporation has a controlling financial interest or is the primary beneficiary. Investments in joint ventures where the Corporation owns 20% to 50% of the voting stock and has the ability to exercise significant influence over the operating and financial policies of the joint venture are accounted for using the equity method of accounting. Investments in joint ventures whereby the Corporation does not have the ability to exercise significant influence over the operating and financial policies of the joint venture are accounted for using the cost method of accounting. Investments in joint ventures are reviewed for impairment whenever events or circumstances indicate the carrying amount of the investment may not be recoverable. If the estimated fair value of the investment is less than the carrying amount and such decline is determined to be “other than temporary,” then the investment may not be fully recoverable potentially resulting in a write-down of the investment value. Intercompany accounts and transactions are eliminated.

Cash and Cash Equivalents

Securities with purchased original maturities of three months or less are considered to be cash equivalents. The Corporation maintains cash and cash equivalents at various financial institutions which may exceed federally insured amounts.

Inventories

Inventories are valued at the lower of cost and net realizable value, which is defined as the estimated selling price in the ordinary course of business less reasonably predictable costs of completion, disposal and transportation. Cost includes the cost of raw materials, direct labor and overhead for those items manufactured but not yet sold or for which title has not yet transferred. Fixed production overhead is allocated to inventories based on normal capacity of the production facilities. In periods of abnormally high production, the amount of fixed overhead allocated to each unit of production is decreased so that inventories are not measured above cost. The amount of fixed overhead allocated to inventories is not increased as a consequence of abnormally low production or plant idling. Costs for abnormal amounts of spoilage, handling costs and freight costs are charged to expense when incurred. Cost of domestic raw materials, work-in-process and finished goods inventories is primarily determined by the last-in, first-out (LIFO) method. Cost of domestic supplies and foreign inventories is determined primarily by the first-in, first-out (FIFO) method.

Property, Plant and Equipment

Property, plant and equipment purchased new is recorded at cost with depreciation computed using the straight-line method over the following estimated useful lives: land improvements – 15 to 20 years, buildings – 25 to 50 years and machinery and equipment – 3 to 25 years. Property, plant and equipment acquired as part of a business combination is recorded at its estimated fair value with depreciation computed using the straight-line method over the estimated remaining useful lives based in part on third-party valuations. Expenditures that extend economic useful lives are capitalized. Routine maintenance is charged to expense. Gains or losses are recognized on retirements or disposals. Property, plant and equipment are reviewed for impairment at least annually, or whenever events or changes in circumstances indicate the carrying amount of the asset may not be recoverable. If the undiscounted cash flows generated from the use and eventual disposition of the assets are less than their carrying value, then the asset value may not be fully recoverable potentially resulting in a write-down of the asset value. Estimates of future cash flows are based on expected market conditions over the remaining useful life of the primary asset(s). In addition, the remaining depreciation period for the impaired asset would be reassessed and, if necessary, revised. Proceeds from government grants are recorded as a reduction in the purchase price of the underlying assets and amortized against depreciation over the lives of the related assets.

Intangible Assets

Intangible assets primarily consist of developed technology, customer relationships and trade name. Intangible assets with definite lives are amortized using the straight-line method over their estimated useful life, which is determined by identifying the period over which most of the cash flows are expected to be generated. Additionally, intangible assets, both definite and indefinite lived, are reviewed for impairment at least annually, as of October 1, or whenever events or changes in circumstances indicate the carrying amount of the asset may not be recoverable. If the undiscounted cash flows attributable to the assets are less than their carrying value, then the asset value may not be fully recoverable potentially resulting in a write-down of the asset value. Also, if the estimate of an intangible asset's remaining useful life changes, the remaining carrying value of the intangible asset will be amortized prospectively over the revised remaining useful life.

Goodwill

Goodwill represents the consideration paid in a business combination in excess of the values assigned to the net assets of the acquired entity. Goodwill is not amortized but is tested for impairment at the reporting unit level annually, as of October 1, or whenever events or changes in circumstances indicate the carrying amount may not be recoverable. Goodwill is evaluated for impairment either qualitatively or quantitatively using a two-step approach. Under step one, the fair value of the reporting unit is determined using both a market and income approach. If the fair value of the reporting unit is less than the carrying value of the reporting unit, then goodwill may be impaired causing the second step of the analysis to be completed. Under step two, the fair value of the reporting is allocated to the assets and liabilities of the reporting unit. The unallocated fair value ("implied goodwill"), if any, is compared to the recorded value of goodwill. If the implied goodwill exceeds the recorded value of goodwill, then goodwill is deemed not to be impaired. If the implied goodwill is less than the recorded value of goodwill, then goodwill is deemed to be impaired by the amount that goodwill exceeds implied goodwill. Estimating the fair value of a reporting unit requires the use of significant unobservable inputs, representative of a Level 3 fair value measurement, including market growth and market share, sales volumes and prices, costs to produce, discount rate and estimated capital needs. Management considers historical experience and all available information at the time the fair value of the reporting unit is estimated. Assumptions used to estimate future cash flows are subject to a high degree of judgment and complexity.

Debt Issuance Costs

Debt issuance costs are amortized as interest expense over the scheduled maturity period of the debt. The costs related to our line-of-credit arrangement are amortized over the term of the arrangement, regardless of whether there are any outstanding borrowings. Unamortized debt issuance costs are either recognized as a direct deduction from the carrying amount of the related debt or, if related to a line-of-credit facility, as an other noncurrent asset on the consolidated balance sheet.

Product Warranty

Provisions for product warranties are recognized at the time the underlying sale is recorded. The provision is based on historical experience as a percentage of sales adjusted for potential claims when a liability is probable and for known claims.

Employee Benefit Plans

Funded Status

If the fair value of the plan assets exceeds the projected benefit obligation, the over-funded projected benefit obligation is recognized as an asset (prepaid pensions) on the consolidated balance sheet. Conversely, if the projected benefit obligation exceeds the fair value of the plan assets, the under-funded projected benefit obligation is recognized as a liability (employee benefit obligations) on the consolidated balance sheet. Gains and losses arising from the difference between actuarial assumptions and actual experience and unamortized prior service costs are recorded as a separate component of accumulated other comprehensive loss.

Net Periodic Pension and Other Postretirement Costs

Net periodic pension and other postretirement costs includes service cost, interest cost, expected rate of return on the market-related value of plan assets, amortization of prior service costs and recognized actuarial gains or losses. When actuarial gains or losses exceed 10% of the greater of the projected benefit obligation or the market-related value of plan assets, they are amortized to net periodic pension and other postretirement costs over the average remaining service period of the employees expected to receive benefits under the plan or over the remaining life expectancy of the employees expected to receive benefits if “all or almost all” of the plan’s participants are inactive. When actuarial gains or losses are less than 10% of the greater of the projected benefit obligation or the market-related value of plan assets, they are included in net periodic pension and other postretirement costs indirectly as a result of lower/higher interest costs arising from a decrease/increase in the projected benefit obligation. The market-related value of plan assets is determined using a five-year moving average which recognizes 20% of unrealized gains and losses each year.

Other Comprehensive Income (Loss)

Other comprehensive income (loss) includes changes in assets and liabilities from non-owner sources including foreign currency translation adjustments, unamortized prior service costs and unrecognized actuarial gains and losses associated with employee benefit plans, unrealized holding gains and losses on securities designated as available for sale, and changes in the fair value of derivatives designated and effective as cash flow hedges. Certain components of other comprehensive income (loss) are presented net of income tax. Foreign currency translation adjustments exclude the effect of income tax since earnings of non-U.S. subsidiaries are deemed to be reinvested for an indefinite period of time.

Reclassification adjustments are amounts which are realized during the year and, accordingly, are deducted from other comprehensive income (loss) in the period in which they are included in net income (loss) or when a transaction no longer qualifies as a cash flow hedge. Foreign currency translation adjustments are included in net income (loss) upon sale or upon complete or substantially complete liquidation of an investment in a foreign entity. With respect to employee benefit plans, unamortized prior service costs are included in net income (loss), either immediately upon curtailment of the employee benefit plan or over the average remaining service period or life expectancy of the employees expected to receive benefits, and unrecognized actuarial gains and losses are included in net income (loss) indirectly as a result of lower/higher interest costs arising from a decrease/increase in the projected benefit obligation. Unrealized holding gains and losses on securities are included in net income (loss) when the underlying security is sold.

Changes in the fair value of derivatives are included in net income (loss) when the projected sale occurs or, if a foreign currency purchase contract, over the estimated useful life of the underlying asset.

Foreign Currency Translation

Assets and liabilities of the Corporation's foreign operations are translated at year-end exchange rates and the statements of operations are translated at the average exchange rates for the year. Gains or losses resulting from translating foreign currency financial statements are accumulated as a separate component of accumulated other comprehensive loss until the entity is sold or substantially liquidated.

Revenue Recognition

Revenue from sales is recognized when persuasive evidence of an arrangement exists, delivery has occurred, the sales price is fixed or determinable, and collectability is reasonably assured. Persuasive evidence of an arrangement identifies the final understanding between the parties as to the specific nature and terms of the agreed-upon transaction that creates enforceable obligations. It can be in the form of an executed purchase order from the customer, sales agreement issued by the Corporation or a similar arrangement deemed to be normal and customary business practice for that particular customer or class of customer (collectively, a sales agreement).

Delivery and performance is considered to have occurred when the customer has taken title and assumed the risks and rewards of ownership of the product. Typically, this occurs when the product is shipped to the customer (i.e., FOB shipping point), delivered to the customer (i.e., FOB destination), or, for foreign sales, in accordance with trading guidelines known as Incoterms. Incoterms are standard trade definitions used in international contracts and are developed, maintained and promoted by the ICC Commission on Commercial Law and Practice.

The sales price required to be paid by the customer is fixed or determinable from the sales agreement. It is not subject to refund or adjustment except for a variable-index surcharge provision which increases or decreases, as applicable, the selling price of a mill roll for corresponding changes in the published index cost of certain raw materials. The variable-index surcharge is recognized as revenue when the corresponding revenue for the inventory is recognized. Likelihood of collectability is assessed prior to acceptance of an order. There are no customer-acceptance provisions other than customer inspection and testing prior to shipment. Post-shipment obligations are insignificant.

Amounts billed to the customer for shipping and handling are recorded within net sales and the related costs are recorded within costs of products sold (excluding depreciation and amortization). Amounts billed for taxes assessed by various government authorities (e.g., sales tax, value-added tax, etc.) are excluded from the determination of net income (loss) and instead are recorded as a liability until remitted to the government authority.

Stock-Based Compensation

Stock-based compensation, such as stock options, restricted stock units and performance shares, is recognized over the vesting period based upon the fair value of the award at the date of grant. For stock options, the fair value is determined by the Black Scholes option pricing model and is expensed over the vesting period of three years. For restricted stock units, the fair value is equal to the closing price of the Corporation's common stock on the New York Stock Exchange ("NYSE") on the date of grant and is expensed over the vesting period of three years. For performance share awards that vest subject to a performance condition, the fair value is equal to the closing price of the Corporation's stock on the NYSE on the date of grant. For performance share awards that vest subject to a market condition, fair value is determined using a Monte Carlo simulation model. The fair value of performance share awards is expensed over the performance period when it is probable that the performance condition will be achieved.

Derivative Instruments

Derivative instruments which include forward exchange (for foreign currency sales and purchases) and futures contracts are recorded on the consolidated balance sheet as either an asset or a liability measured at their fair value. The accounting for changes in the fair value of a derivative depends on the use of the derivative. To the extent that a derivative is designated and effective as a cash flow hedge of an exposure to future changes in value, the change in the fair value of the derivative is deferred in accumulated other comprehensive loss. Any portion considered to be ineffective, including that arising from the unlikelihood of an anticipated transaction to occur, is reported as a component of earnings (other income/expense) immediately.

Upon occurrence of the anticipated sale, the foreign currency sales contract designated and effective as a cash flow hedge is de-designated as a fair value hedge and the change in fair value previously deferred in accumulated other comprehensive loss is reclassified to earnings (net sales) with subsequent changes in fair value recorded as a component of earnings (other income/expense). Upon occurrence of the anticipated purchase, the foreign currency purchase contract is settled and the change in fair value deferred in accumulated other comprehensive loss is reclassified to earnings (depreciation and amortization expense) over the life of the underlying assets. Upon settlement of a futures contract, the change in fair value deferred in accumulated other comprehensive loss is reclassified to earnings (costs of products sold, excluding depreciation and amortization) when the corresponding inventory is sold and revenue is recognized. To the extent that a derivative is designated and effective as a hedge of an exposure to changes in fair value, the change in the derivative's fair value will be offset in the statement of operations by the change in the fair value of the item being hedged and is recorded as a component of earnings (other income/expense). Cash flows associated with the derivative instruments are recorded as a component of operating activities on the consolidated statement of cash flows.

The Corporation does not enter into derivative transactions for speculative purposes and, therefore, holds no derivative instruments for trading purposes.

Fair Value

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants as of the measurement date. A hierarchy of inputs is used to determine fair value measurements with three levels. Level 1 inputs are quoted prices in active markets for identical assets or liabilities and are considered the most reliable evidence of fair value. Level 2 inputs are observable prices that are not quoted on active exchanges. Level 3 inputs are unobservable inputs used for measuring the fair value of assets or liabilities.

Legal Costs

Legal costs expected to be incurred in connection with loss contingencies are accrued when such costs are probable and estimable.

Income Taxes

On December 22, 2017, the U.S. federal government enacted the Tax Cuts and Jobs Act (the "Tax Reform"), to become effective January 1, 2018, which, among other things, imposed a one-time tax on deemed repatriated earnings of foreign subsidiaries. Accordingly, the tax impact of this deemed repatriation of previously untaxed foreign earnings was included within the U.S. taxable income for 2017, reducing the overall tax loss generated in the current year. Any future income earned in foreign subsidiaries will no longer be subject to U.S. tax under current U.S. law. Any remittance of future earnings to the U.S. will be subject to foreign withholding requirements; however, the Corporation estimates the impact of this would be insignificant.

Income taxes are recognized during the year in which transactions enter into the determination of financial statement income. Deferred income tax assets and liabilities are recognized for the future tax consequences of temporary differences between the book carrying amount and the tax basis of assets and liabilities including net operating loss carryforwards. A valuation allowance is provided against a deferred income tax asset when it is "more likely than not" the asset will not be realized. Similarly, if a determination is made that it is "more likely than not" the deferred income tax asset will be realized, the related valuation allowance would be reduced and a benefit to earnings would be recorded. Penalties and interest are recognized as a component of the income tax provision.

Tax benefits are recognized in the financial statements for tax positions taken or expected to be taken in a tax return when it is "more likely than not" that the tax authorities will sustain the tax position solely on the basis of the position's technical merits. Consideration is given primarily to legislation and statutes, legislative intent, regulations, rulings and case law as well as their applicability to the facts and circumstances of the tax position when assessing the sustainability of the tax position. In the event a tax position no longer meets the “more likely than not” criteria, the tax benefit is reversed by recognizing a liability and recording a charge to earnings. Conversely, if a tax position subsequently meets the “more likely than not” criteria, a tax benefit would be recognized by reducing the liability and recording a credit to earnings.

Earnings Per Common Share

Basic earnings per common share is computed by dividing net income (loss) by the weighted average number of common shares outstanding for the period. The computation of diluted earnings per common share is similar to basic earnings per common share except that the denominator is increased to include the dilutive effect of the net additional common shares that would have been outstanding assuming exercise of outstanding stock awards, calculated using the treasury stock method. The computation of diluted earnings per share would not assume the exercise of an outstanding stock award if the effect on earnings per common share would be antidilutive. Similarly, the computation of diluted earnings per share would not assume the exercise of outstanding stock awards if the Corporation incurred a net loss since the effect on earnings per common share would be antidilutive. The weighted average number of common shares outstanding assuming exercise of dilutive stock awards was 12,330,401 for 2017, 11,951,181 for 2016 and 10,447,066 for 2015. Weighted-average outstanding stock awards excluded from the diluted earnings per common share calculation, since the effect would have been antidilutive, were 1,013,008 for 2017, 1,163,396 for 2016 and 1,138,287 for 2015.

Recently Implemented Accounting Pronouncements

In January 2018, the Financial Accounting Standards Board ("FASB") issued ASU 2018-02, Income Statement – Reporting Comprehensive Income, which allows for a reclassification from accumulated other comprehensive income (loss) to retained earnings for the stranded tax effects resulting from the Tax Reform. A stranded tax effect is defined as the difference in the tax effect of amounts recognized as other comprehensive income (loss) items, using the income tax rate in effect at the time of recognition and the newly enacted income tax rate. ASU 2018-02 is relevant only to the reclassification of the income tax effects of the Tax Reform; accordingly, the underlying guidance that requires that the effect of a change in tax laws or rates be included in income from continuing operations is not affected. The guidance becomes effective for interim and annual periods beginning after December 15, 2018; however, early adoption is permitted. The Corporation adopted the new guidance in its 2017 accounts and, as a result, $6,088 was reclassified between accumulated other comprehensive loss and retained earnings.

In March 2016, the FASB issued ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, which requires all income tax effects of awards to be recognized in the income statement when the awards vest or are settled. The guidance also requires presentation of excess tax benefits as an operating activity on the statement of cash flows rather than as a financing activity. The amended guidance became effective for the Corporation January 1, 2017, and did not have a significant impact on its financial position, operating results or liquidity.

In July 2015, the FASB issued ASU 2015-11, Simplifying the Measurement of Inventory, which revises the measurement of inventory at the lower of cost or market. In accordance with ASU 2015-11, an entity will measure inventory at the lower of cost and net realizable value, which is defined as the estimated selling price in the ordinary course of business less reasonably predictable costs of completion, disposal and transportation. The amendment does not apply to inventory that is measured using the last-in, first out (LIFO) method. The guidance became effective for the Corporation January 1, 2017, and did not have a significant impact on its financial position, operating results or liquidity.

Recently Issued Accounting Pronouncements

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging, which amends and simplifies existing guidance to allow companies to more accurately present the economic effects of risk management activities in the financial statements. The amended guidance will be effective for interim and annual periods beginning after December 15, 2018; however, early adoption is permitted. The Corporation is currently evaluating the impact the guidance will have on its financial position and operating results. It will not, however, affect the Corporation's liquidity.

In May 2017, the FASB issued ASU 2017-09, Scope of Modification Accounting, which provides guidance about which changes to the terms and conditions of a share-based payment award require an entity to apply modification accounting. The amendment will be applied prospectively to an award modified on or after the adoption date. The amended guidance will be effective for interim and annual periods beginning after December 15, 2017. The guidance will not affect the Corporation's financial position, operating results and liquidity as of the date of adoption.

In March 2017, the FASB issued ASU 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, which requires an employer who offers defined benefit and postretirement benefit plans to report the service cost component of net periodic benefit cost in the same line item or items as other compensation costs arising from services rendered by employees during the period. The other components of net periodic benefit cost are required to be presented in the income statement separately from the service cost component and outside the subtotal of income from operations. The amendment also allows only for the service cost component of net periodic benefit cost to be eligible for capitalization when applicable. The amended guidance does not change the amount of net periodic benefit cost to be recognized, only where it is to be recognized in the income statement. The amended guidance becomes effective for interim and annual periods beginning after December 15, 2017, and must be applied retrospectively for the presentation of the service cost component and the other components of net periodic pension and other postretirement costs in the income statement and prospectively for capitalization of the service cost component of net periodic benefit cost in inventory. A practical expedient is available permitting employers to use the amounts disclosed in its pension and other postretirement benefit plan footnote (Note 9) as the estimate to apply retrospectively. The guidance will not affect the Corporation's financial position or liquidity.

In August 2016, the FASB issued ASU 2016-15, Classification of Certain Cash Receipts and Cash Payments, which clarifies guidance on the classification of certain cash receipts and payments in the statement of cash flows. The amended guidance will be effective for interim and annual periods beginning after December 15, 2017. The guidance will not have a significant impact on the presentation of the Corporation's cash flow statement, and it will not affect its financial position, operating results or liquidity.

In May 2016, April 2016, March 2016 and May 2014, the FASB issued ASUs 2016-12, 2016-10, 2016-08 and 2014-09, respectively, Revenue from Contracts with Customers (Topic 606), which provides a common revenue standard for U.S. GAAP and IFRS. The guidance establishes principles for reporting information about the nature, amount, timing and uncertainty of revenue and cash flows arising from a company's contracts with customers. It requires companies to apply a five-step model when recognizing revenue relating to the transfer of goods or services to customers in an amount that reflects the consideration that the company expects to be entitled to receive for those goods and services. It also requires comprehensive disclosures regarding revenue recognition. The guidance becomes effective for interim and annual periods beginning after December 15, 2017, and can be implemented on either a full or modified retrospective basis. The Corporation will use the modified retrospective method (a cumulative adjustment to its January 1, 2018 retained earnings). Based on the evaluation of its current contracts and revenue streams, the Corporation determined they will be recorded consistently under both existing generally accepted accounting principles and the new standard. Accordingly, the new guidance will not have a material effect on the Corporation's financial position, operating results or liquidity. The Corporation's disclosures, however, will change significantly in response to the requirements of the new guidance.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which requires lessees to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with a term of more than one year. Accounting by lessors will remain similar to existing generally accepted accounting principles. The guidance becomes effective for the Corporation January 1, 2019. The Corporation is currently evaluating the impact the guidance will have on its financial position, operating results and liquidity.

In January 2016, the FASB issued ASU 2016-01, Recognition and Measurement of Financial Assets and Liabilities, which simplifies the accounting and disclosures related to equity investments. ASU 2016-01 will require entities to carry certain investments in equity securities at fair value with changes in fair value recorded through net income (loss) versus other comprehensive income (loss). ASU 2016-01 does not apply to investments that qualify for the equity method of accounting or to those that result in consolidation of the investee. The guidance becomes effective for interim and annual periods beginning after December 15, 2017, and must be adopted by means of a cumulative-effect adjustment to retained earnings as of the beginning of the fiscal year of adoption. At December 31, 2017, unrealized holding gains on securities approximated $600 which will be recorded as the cumulative-effect adjustment to retained earnings. Prospectively, the guidance is not expected to have a significant effect on the Corporation's financial position, operating results and liquidity.

NOTE 2 – ACQUISITIONS:

Acquisition of Åkers

On March 3, 2016, the Corporation acquired 100% of the voting equity interest of Åkers from Altor Fund II GP Limited. The purchase price approximated $74,155 and was comprised of $29,399 in cash, $22,619 in the form of three-year promissory notes (Note 8), and 1,776,604 shares of common stock of the Corporation which, based on the closing price of the Corporation's common stock as of the date of closing, had a fair value of $22,137.

The acquisition added roll production facilities in Sweden, the United States, Slovenia, and China; and a number of sales offices. It enabled cast roll production in the United States, forged roll production in Europe, and a low-cost product alternative for customers.

Operating results of the acquired entities are included in the Forged and Cast Engineered Products segment from the date of acquisition. For the ten months ended December 31, 2016, net sales for Åkers approximated $121,079 and loss before income taxes, including the effects of purchase accounting, approximated $10,130.

The fair value of assets acquired and liabilities assumed as of the date of acquisition is as follows:

Current assets (excluding inventories)	$41,703
Inventories	30,332
Property, plant and equipment	71,871
Intangible assets	11,784
Other noncurrent assets	8,068
Current liabilities	(71,690)
Noncurrent liabilities	(43,153)
Net assets acquired	48,915
Noncontrolling interest	(2,019)
Goodwill	27,259
Base purchase price	$74,155

Goodwill is not amortized but is tested for impairment at the reporting unit level annually, as of October 1, or whenever events or changes in circumstances indicate the carrying amount may not be recoverable. Based on the first step of the two-step quantitative goodwill impairment test performed as of October 1, 2016, the Corporation determined that the carrying value of the Forged and Cast Engineered Products reporting unit was greater than its estimated fair value, and the second step of the two-step quantitative goodwill impairment test was performed to determine the amount of the impairment charge.

As a result of the second step evaluation, the Corporation determined that the goodwill reported in the Forged and Cast Engineered Products reporting unit was fully impaired, primarily due to depressed market conditions and limitations inherent in its current market capitalization, and, accordingly, recorded a goodwill impairment charge of $26,261 for the year ended December 31, 2016. The goodwill impairment charge represents a full impairment and differs from the amount recognized as of the acquisition date due to changes in foreign currency exchange rates used to translate goodwill from the entities' local currency to the U.S. dollar.

Acquisition of ASW

On November 1, 2016, the Corporation acquired 100% of the voting equity interest of ASW, a specialty steel producer, from CK Pearl Fund, Ltd., CK Pearl Fund L.P. and White Oak Strategic Master Fund, L.P. to support its diversification efforts in the open-die forging market. The purchase price of $13,116 consisted of $3,500 in cash and $9,616 in the assumption of outstanding indebtedness. The fair value of assets acquired and liabilities assumed as of the date of the acquisition is summarized below.

Current assets (excluding inventories)	$6,525
Inventories	6,956
Property, plant and equipment	10,310
Current liabilities	(10,675)
Outstanding indebtedness	(9,616)
Base purchase price	$3,500

Operating results of ASW are included in the Forged and Cast Engineered Products segment from the date of acquisition. For the two months ended December 31, 2016, net sales for ASW approximated $7,523 and loss before income taxes approximated $1,781.

Acquisition-Related Transaction Costs

Acquisition-related transaction costs of $3,056 and $3,383 for the year ended December 31, 2016, and 2015, respectively, were incurred relating principally to the purchase of Åkers and ASW and are included in selling and administrative costs.

Pro Forma Financial Information for the Åkers and ASW Acquisitions (unaudited)

The following financial information presents the combination of the results of operations of Ampco, Åkers and ASW as though the acquisition date for both of the business combinations had occurred as of January 1, 2015. Pro forma adjustments have been made to (i) include the net incremental depreciation and amortization expense associated with recording property, plant and equipment and definite-lived intangible assets at fair value and (ii) remove debt-related expenses associated with previous debt facilities not assumed by the Corporation. The following pro forma financial information is presented for informational purposes only and is not necessarily indicative of the results of operations that would have been achieved had the acquisition occurred at the beginning of 2015:

	Year Ended December 31,	
	2016	2015
Net sales	$393,243	$440,265
Loss before income taxes (includes noncontrolling interest)	$(63,498)	$(11,945)
Net loss attributable to Ampco-Pittsburgh	$(85,778)	$(24,740)
Net loss per common share (basic) attributable to Ampco-Pittsburgh	$(6.94)	$(2.03)

Other Acquisition

On July 29, 2015, the Corporation acquired the assets of AUP. The purchase price of $5,000 was funded by available cash. The pro forma impact on Corporation's net sales and loss before income taxes was not significant to its consolidated results for 2015.

NOTE 3 – INVESTMENTS IN JOINT VENTURES:

The Corporation has interests in three joint ventures:

- Shanxi Åkers TISCO Roll Co., Ltd. ("ATR") – a cast roll joint venture in China for which the Corporation accounts using the consolidated method of accounting. ATR principally manufactures and sells cast mill rolls for the hot strip mill, steckel mill and medium plate mill.
- Masteel Gongchang Roll Co., Ltd. ("MG") – a forged roll joint venture in China for which, effective in 2017, the Corporation accounts using the cost method of accounting. MG principally manufactures and sells forged backup mill rolls for hot and cold strip mills.
- Jiangsu Gongchang Roll Co., Ltd ("Gongchang") – a cast roll joint venture in China for which the Corporation accounts using the cost method of accounting. Gongchang principally manufactures and sells cast mill rolls for hot and cold strip mills, medium/heavy section mills and plate mills.

ATR

In 2007, Åkers AB entered into an agreement with Taiyuan Iron & Steel Co., Ltd. ("TISCO") to form ATR, with Åkers AB owning 59.88% and TISCO owning 40.12%. Since Åkers AB is the majority shareholder, has voting rights proportional to its ownership interest and exercises control over TISCO, Åkers AB is considered the primary beneficiary and, accordingly, accounts for its investment in ATR on the consolidated method of accounting.

MG

In 2007, a subsidiary of UES entered into an agreement with Maanshan Iron & Steel Company Limited (Maanshan) to form Union Electric Steel MG Roll Co., Ltd ("UES-MG"), with UES owning 49% and Maanshan owning 51%. Both companies contributed cash for their respective interests (which equated to $14,700 for UES). In November 2016, in connection with an equity restructuring of UES-MG, UES transferred 16% of its equity interest to Gongchang for $2,400, payable in installments over the next three years. As of December 31, 2017, UES received payments of $1,500. As part of the equity restructuring, the joint venture company was renamed Masteel Gongchang Roll Co., Ltd. ("MG"). The Corporation no longer participates in the management or daily operation of MG and has not guaranteed any of the obligations of the joint venture; accordingly, its maximum exposure of loss is limited to its remaining investment, which is recorded at cost, or approximately $835, at December 31, 2017. Dividends may be declared by the Board of Directors of the joint venture after allocation of after-tax profits to various "funds" equal to the minimum amount required under Chinese laws. No dividends were declared or received in 2017, 2016 or 2015.

Gongchang

The Corporation has a 24% interest in Gongchang which is recorded at cost, or $1,340. The Corporation does not participate in the management or daily operation of Gongchang, has not guaranteed any of its obligations and has no ongoing responsibilities to it. Dividends may be declared by the Board of Directors of the joint venture after allocation of after-tax profits to various “funds” equal to the minimum amount required under Chinese law. Approximately $395 of dividends were declared and received in 2016. No dividends were declared or received in 2017 or 2015.

NOTE 4 – INVENTORIES:

	2017	2016
Raw materials	$24,249	$23,964
Work-in-progress	42,840	29,198
Finished goods	24,083	20,046
Supplies	16,389	10,371
Inventories	$107,561	$83,579

At December 31, 2017, and 2016, approximately 42% and 45%, respectively, of the inventories were valued using the LIFO method. The LIFO reserve approximated $(16,063) and $(15,139) at December 31, 2017, and 2016, respectively. During each of the years, inventory quantities decreased for certain locations resulting in a liquidation of LIFO layers which were at lower costs. The effect of the liquidations was to decrease costs of products sold (excluding depreciation and amortization) by approximately $490, $936 and $216 for 2017, 2016 and 2015, respectively. There was no income tax expense recognized in the consolidated statements of operations for 2017 and 2016, due to the Corporation having a valuation allowance recorded against its deferred income tax assets for the jurisdiction where the income was recognized. See Note 15. Accordingly, the effect of the liquidations reduced net loss by approximately $490, or $0.04 per common share, for 2017, $936, or $0.08 per common share, for 2016, and increased net income by approximately $141, or $0.01 per common share, for 2015.

NOTE 5 – PROPERTY, PLANT AND EQUIPMENT:

	2017	2016
Land and land improvements	$12,172	$11,747
Buildings	68,572	66,017
Machinery and equipment	340,396	323,684
Construction-in-process	5,019	2,595
Other	7,193	7,495
	433,352	411,538
Accumulated depreciation	(218,372)	(197,130)
Property, plant and equipment, net	$214,980	$214,408

The majority of the assets of the Corporation, except real property including the land and building of UES-UK, is pledged as collateral for the Corporation’s revolving credit facility (see Note 8). Land and buildings of UES-UK, equal to approximately $2,831 (£2,098) at December 31, 2017, are held as collateral by the trustees of the UES-UK defined benefit pension plan (see Note 9). The gross value of assets under capital lease and the related accumulated amortization approximated $4,082 and $1,101, respectively, as of December 31, 2017, and $3,610 and $691, respectively, as of December 31, 2016.

NOTE 6 – INTANGIBLE ASSETS:

	2017	2016
Customer relationships	$6,543	$6,244
Developed technology	4,429	4,248
Trade name	2,696	2,537
	13,668	13,029
Accumulated amortization	(2,647)	(1,428)
Intangible assets, net	$11,021	$11,601

The following summarizes changes in intangible assets for the year ended December 31:

	2017	2016
Balance at the beginning of the year	$11,601	$1,193
Changes in intangible assets	0	11,784
Amortization of intangible assets	(1,219)	(1,106)
Other, primarily impact from changes in foreign currency exchange rates	639	(270)
Balance at the end of the year	$11,021	$11,601

Intangible assets include an indefinite-lived trade name of $2,696 and $2,537 as of December 31, 2017, and 2016, respectively, that is not subject to amortization. Changes during the year ended December 31, 2016, primarily represent intangible assets identified as part of the Åkers acquisition. Identifiable intangible assets are expected to be amortized over a weighted average period of approximately 12 years or $1,248 for 2018, $1,248 for 2019, $1,248 for 2020, $541 for 2021, $400 for 2022 and $3,640 thereafter.

NOTE 7 – OTHER CURRENT LIABILITIES:

	2017	2016
Customer-related liabilities	$18,512	$21,564
Accrued interest payable	2,697	2,274
Accrued sales commissions	2,301	1,693
Other	13,579	16,666
Other current liabilities	$37,089	$42,197

Customer-related liabilities include liabilities for product warranty claims and deposits received on future orders. The following summarizes changes in the liability for product warranty claims for the year ended December 31:

	2017	2016	2015
Balance at the beginning of the year	$11,521	$6,358	$6,672
Acquisitions – opening balance sheet liability for warranty claims	0	7,130	0
Satisfaction of warranty claims	(4,014)	(4,297)	(2,452)
Provision for warranty claims	3,601	3,282	2,293
Other, primarily impact from changes in foreign currency exchange rates	594	(952)	(155)
Balance at the end of the year	$11,702	$11,521	$6,358

NOTE 8 – BORROWING ARRANGEMENTS:

In May 2016, the Corporation entered into a five-year Revolving Credit and Security Agreement (the “Credit Agreement”) with a syndicate of banks. The Credit Agreement provides for a senior secured asset-based revolving credit facility that replaced the Corporation’s previously existing line of credit and letter of credit facilities. The Credit Agreement provides for initial borrowings not to exceed $100,000 with an option to increase the credit facility by an additional $50,000 at the request of the Corporation and with the approval of the banks. The Corporation amended the Credit Agreement in 2016 to provide additional intercompany lending capacity to certain of its subsidiaries and expand available currencies for its letters of credits. The Credit Agreement was also amended in 2017 to add Åkers AB and ASW as borrowers and modify regional sublimits. As amended, the Credit Agreement includes sublimits for letters of credit not to exceed $40,000, European borrowings not to exceed $15,000, and Canadian borrowings not to exceed $15,000. Deferred financing fees of approximately $1,250 were incurred for the Credit Agreement and are being amortized over the life of the Credit Agreement.

Availability under the Credit Agreement is based on eligible accounts receivable, inventory and fixed assets. Amounts outstanding under the credit facility bear interest at the Corporation's option at either (i) LIBOR plus an applicable margin ranging between 1.25% to 1.75% based on the quarterly average excess availability or (ii) the base rate plus an applicable margin ranging between 0.25% to 0.75% based on the quarterly average excess availability. Additionally, the Corporation is required to pay a commitment fee ranging between 0.25% and 0.375% based on the daily unused portion of the credit facility. As of December 31, 2017, the Corporation had outstanding borrowings under the Credit Agreement of $20,349 (including £1,000 of European borrowings for its U.K. subsidiary). Interest accrued on the outstanding balance during the year at an average of approximately 2.75%. Additionally, the Corporation had utilized a portion of the credit facility for letters of credit (Note 10). As of December 31, 2017, remaining availability under the Credit Agreement approximated $56,000. No borrowings were outstanding under the Credit Agreement during 2016.

The debt outstanding under the Credit Agreement is collateralized by a first priority perfected security interest in substantially all of the assets of the Corporation and its subsidiaries (other than real property). Additionally, the Credit Agreement contains customary affirmative and negative covenants and limitations, including, but not limited to, investments in certain of its subsidiaries, payment of dividends, incurrence of additional indebtedness, upstream distributions from subsidiaries, and acquisitions and divestures. The Corporation must also maintain a certain level of excess availability. If excess availability falls below the established threshold, or in an event of default, the Corporation will be required to maintain a minimum fixed charge coverage ratio of not less than 1.00 to 1.00. The Corporation was in compliance with the applicable bank covenants as of December 31, 2017.

In March 2017, the Corporation repaid the debt assumed in connection with the acquisition of ASW (credit facility and term loan), including interest, fees and early termination costs. Accordingly, outstanding borrowings of the Corporation as of December 31, 2017, and 2016, consisted of the following:

	2017	2016
Industrial Revenue Bonds	$13,311	$13,311
Promissory notes (and interest)	25,395	23,844
Revolving Credit and Security Agreement	20,349	0
Minority shareholder loan	5,325	4,990
Credit facility		