BELDEN INC.
Form 10-K
February 20, 2019
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)
þ Annual report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the fiscal year ended December 31, 2018
or
o Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the transition period from to
Commission File No. 001-12561
BELDEN INC.
(Exact Name of Registrant as Specified in Its Charter)

Delaware	36-3601505
(State or Other Jurisdiction of Incorporation or Organization)	(IRS Employer Identification No.)

1 North Brentwood Boulevard
15th Floor
St. Louis, Missouri 63105
(Address of Principal Executive Offices and Zip Code)
(314) 854-8000
(Registrant's Telephone Number, Including Area Code)
Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, $0.01 par value	The New York Stock Exchange
Depositary Shares, each representing a 1/100th interest in a share of 6.75% Series B Mandatory Converible Preferred Stock	The 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 þ No o.
Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes o No þ.
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 þ No o.
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. þ
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 (section 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes þ No o.

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

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

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

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

At July 1, 2018, the aggregate market value of Common Stock of Belden Inc. held by non-affiliates was $1,874,027,335 based on the closing price ($61.12) of such stock on such date.

There were 39,399,412 shares of registrant’s Common Stock outstanding on February 15, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

The registrant intends to file a definitive proxy statement for its annual meeting of stockholders within 120 days of the end of the fiscal year ended December 31, 2018 (the “Proxy Statement”). Portions of such proxy statement are incorporated by reference into Part III.

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Part I

Item 1. Business

General

Belden Inc. (Belden, the Company, us, we, or our) is an innovative signal transmission solutions company built around two global business platforms – Enterprise Solutions and Industrial Solutions. Each of the global business platforms represents a reportable segment. Financial information about our segments appears in Note 5 to the Consolidated Financial Statements.

Our comprehensive portfolio of signal transmission solutions provides industry leading secure and reliable transmission of data, sound, and video for mission critical applications. We sell our products to distributors, end-users, installers, and directly to original equipment manufacturers (OEMs). Belden Inc. is a Delaware corporation incorporated in 1988, but the Company's roots date back to its founding by Joseph Belden in 1902.

As used herein, unless an operating segment is identified or the context otherwise requires, "Belden," the "Company", and "we" refer to Belden Inc. and its subsidiaries as a whole.

Strategy and Business Model

Our business model is designed to generate shareholder value:

- Operational Excellence—The core of our business model is operational excellence and the execution of our Belden Business System. The Belden Business System has three areas of focus. First, we demonstrate a commitment to Lean enterprise initiatives, which improve not only the quality and efficiency of the manufacturing environment, but our business processes on a company-wide basis. Second, we utilize our Market Delivery System (MDS), a go-to-market model that provides the foundation for organic growth. We believe that organic growth, resulting from both market growth and share capture, is essential to our success. Finally, our Talent Management System supports the development of our associates at all levels, which preserves the culture necessary to operate our business consistently and sustainably.
- Cash Generation—Our pursuit of operational excellence results in the generation of significant cash flow. We generated cash flows from operating activities of $289.2 million, $255.3 million, and $314.8 million in 2018, 2017, and 2016, respectively.
- Portfolio Improvement—We utilize the cash flow generated by our business to fuel our continued transformation and generate shareholder value. We continuously improve our portfolio to ensure we provide the most complete, end-to-end solutions to our customers. Our portfolio is designed with balance across end markets and geographies to ensure we can meet our goals in most economic environments. We have a disciplined acquisition cultivation, execution, and integration system that allows us to invest in outstanding companies that strengthen our capabilities and enhance our ability to serve our customers.

Segments

We operate our business under the two segments – Enterprise Solutions and Industrial Solutions. A synopsis of the segments is included below:

Enterprise Solutions

The Enterprise Solutions (Enterprise) segment is a leading provider in network infrastructure solutions, as well as cabling and connectivity solutions for broadcast, commercial audio/video, and security applications. We serve customers in markets such as healthcare, education, financial, government, and corporate enterprises, as well as end-markets, including sport venues, broadcast studios, and academias. Enterprise product lines include copper cable and connectivity solutions, fiber cable and connectivity solutions, and racks and enclosures. Our products are used in applications such as local area networks, data centers, access control, and building automation. Enterprise provides true end-to-end copper and fiber network systems to include cable, assemblies, interconnect panels, and enclosures. Our products are also used in a variety of applications, including live production and performance, video display and digital signage, and corporate communications. Our high-performance solutions support all networking protocols up to and including 100G+ Ethernet technologies. Enterprise's innovative products can deliver data in addition to power over Ethernet, which meets the higher performance requirements driven by the increasing number of connections in smart buildings. Enterprise products also include intelligent power, cooling, and airflow management for mission-critical data center operations. The Enterprise product portfolio is designed to support Internet Protocol convergence, the increased use of

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wireless communications, and cloud-based data centers by our customers. Our systems are installed through a network of highly trained system integrators and are supplied through authorized distributors.

Industrial Solutions

The Industrial Solutions (Industrial) segment is a leading provider of high performance networking components and machine connectivity products. Industrial products include physical network and fieldbus infrastructure components and on-machine connectivity systems customized to end user and OEM needs. Products are designed to provide reliability and confidence of performance for a wide range of industrial automation applications. Our products are used in applications such as network and fieldbus infrastructure; sensor and actuator connectivity; power, control, and data transmission. Industrial products include solutions such as industrial and input/output (I/O) connectors, industrial cables, IP and networking cables, I/O modules, distribution boxes, ruggedized controls and sensors, and customer specific wiring solutions.

Our industrial cable products are used in discrete manufacturing and process operations involving the connection of computers, programmable controllers, robots, operator interfaces, motor drives, sensors, printers, and other devices. Many industrial environments, such as petrochemical and other harsh-environment operations, require cables with exterior armor or jacketing that can endure physical abuse and exposure to chemicals, extreme temperatures, and outside elements. Other applications require conductors, insulating, and jacketing materials that can withstand repeated flexing. In addition to cable product configurations for these applications, we supply heat-shrinkable tubing and wire management products to protect and organize wire and cable assemblies. Our industrial connector products are primarily used as sensor and actuator connections in factory automation supporting various fieldbus protocols as well as power connections in building automation. These products are used both as components of manufacturing equipment and in the installation and networking of such equipment.

Industrial Solutions products are sold directly to industrial equipment OEMs and through a network of industrial distributors, value-added resellers, and system integrators.

See Note 5 to the Consolidated Financial Statements for additional information regarding our segments.

Acquisitions

A key part of our business strategy includes acquiring companies to support our growth and product portfolio. Our acquisition strategy is based upon targeting leading companies that offer innovative products and strong brands. We utilize a disciplined approach to acquisitions based on product and market opportunities. When we identify acquisition candidates, we conduct rigorous financial and cultural analyses to make certain that they meet both our strategic plan targets and our goal for return on invested capital of 13-15%.

We have completed a number of acquisitions in recent years as part of this strategy. Most recently, in April 2018 we acquired Net-Tech Technology, Inc. (NT2). NT2 is an integrator of optical passive components and network optimization products used within broadband network applications where optical backhaul is used. The results of NT2 have been included in our Consolidated Financial Statements from April 25, 2018, and are reported within the Enterprise Solutions segment.

In February 2018, we acquired Snell Advanced Media (SAM). SAM designs, manufactures, and sells innovative content production and distribution systems for the broadcast and media markets. The results of SAM have been included in our Consolidated Financial Statements from February 8, 2018, and are reported within the Enterprise Solutions segment.

In May 2017, we completed the acquisition of Thinklogical Holdings, LLC (Thinklogical), a leading provider of secure, centralized KVM video switches to the command and control market. The results of Thinklogical have been included in our Consolidated Financial Statements from the acquisition date and are reported in the Enterprise Solutions segment.

In January 2016, we acquired M2FX Limited (M2FX), a manufacturer of fiber optic cable and fiber protection solutions for broadband and telecommunications networks. The results of M2FX have been included in our Consolidated Financial Statements from the acquisition date and are reported in the Enterprise Solutions segment.

For more information regarding these transactions, see Note 4 to the Consolidated Financial Statements.

Customers

We sell to distributors, OEMs, installers, and end-users. Sales to the distributor Anixter International Inc. represented approximately 12% of our consolidated revenues in 2018. No other customer accounted for more than 10% of our revenues in 2018.

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We have supply agreements with distributors and OEM customers. In general, our customers are not contractually obligated to buy our products exclusively, in minimum amounts, or for a significant period of time. We believe that our relationships with our customers and distributors are good and that they are loyal to Belden products as a result of our reputation, the breadth of our product portfolio, the quality and performance characteristics of our products, and our customer service and technical support, among other reasons.

International Operations

In addition to manufacturing facilities in the United States (U.S.), we have manufacturing and other operating facilities in Brazil, Canada, China, India, Japan, Mexico, and St. Kitts, as well as in various countries in Europe. During 2018, approximately 49% of Belden's sales were to customers outside the U.S. Our primary channels to international markets include both distributors and direct sales to end users and OEMs.

Financial information for Belden by country is shown in Note 5 to the Consolidated Financial Statements.

Competition

We face substantial competition in our major markets. The number and size of our competitors vary depending on the product line and segment. Some multinational competitors have greater financial, engineering, manufacturing, and marketing resources than we have. There are also many regional competitors that have more limited product offerings. The markets in which we operate can be generally categorized as highly competitive with many players. In order to maximize our competitive advantages, we manage our product portfolio to capitalize on secular trends and high-growth applications in those markets. Based on available data for our served markets, we estimate that our market share across our segments is significant, ranging from approximately 5% – 20%. A substantial acquisition in one of our served markets would be necessary to meaningfully change our estimated market share percentage.

The principal competitive factors in all our product markets are technical features, quality, availability, price, customer support, and distribution coverage. The relative importance of each of these factors varies depending on the customer. Some products are manufactured to meet published industry specifications and are less differentiated on the basis of product characteristics. We believe that Belden stands out in many of its markets on the basis of our reputation, the breadth of our product portfolio, the quality and performance characteristics of our products, our customer service, and our technical support.

Research and Development

We conduct research and development on an ongoing basis, including new and existing hardware and software product development, testing and analysis, and process and equipment development and testing. See the Consolidated Statements of Operations for amounts incurred for research and development. Many of the markets we serve are characterized by advances in information processing and communications capabilities, including advances driven by the expansion of digital technology, which require increased transmission speeds and greater bandwidth. Our markets are also subject to increasing requirements for mobility, information security, and transmission reliability. Some of our markets are using workflows and resources in public and private cloud and showing preference for software products delivered as services. We believe that our future success will depend in part upon our ability to enhance existing products and to develop, manufacture and deliver new products that meet or anticipate such changes in our served markets.

In our Enterprise Solutions segment, the trend towards increasingly complex broadcast production, management, and distribution environments continues to evolve. Our end-user customers need to increase efficiency and enhance workflow through systems and infrastructure. Our broadcast products allow content producers, broadcasters, and service providers to manage the increasingly complex broadcast signals throughout their operations. In order to support the demand for additional bandwidth and to improve service integrity, broadband service providers are investing in their networks to enhance delivery capabilities to customers for the foreseeable future. Additional bandwidth requirements resulting from increased traffic expose weak points in the network, which are often connectivity related, causing broadband service operators to improve and upgrade residential networks with higher performing connectivity products.

In our Industrial Solutions segment, there is a compelling need among global enterprises, service providers and government agencies to detect, prevent and respond to cyber security threats. This is a long-standing need within corporate networks, but we believe the rapid proliferation of new devices in the “internet of things” will cause this need to broaden and accelerate. Additionally, cyber-attacks are moving beyond traditional targets into critical infrastructure, which will further amplify the importance of our

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work in network security. Furthermore, there is a growing trend toward adoption of Industrial Ethernet technology, bringing to the critical infrastructure the advantages of digital communication and the ability to network devices made by different manufacturers and integrate them with enterprise systems. While the adoption of this technology is at a more advanced stage in certain regions of the world, we believe that the trend will globalize. This trend will also lead to a rising need for wireless systems for some applications and for cybersecurity to protect this critical infrastructure.
Part of our research and development is focused on creating scalable, efficient technologies to provide real-time instrumentation and analytics across entire networks. This includes delivering high-fidelity visibility and deep intelligence about networked systems, their vulnerabilities, and providing actionable information about how to effectively secure them. Additionally, we have highly-skilled and active research teams who analyze current and anticipated threats, and provide offerings to the market to enable customers to quickly detect and resolve cybersecurity threats.

Our research and development efforts are also focused on fiber optic technology, which presents a potential substitute for certain of the copper-based products that comprise a portion of our revenues. Fiber optic cables have certain advantages over copper-based cables in applications where large amounts of information must travel significant distances and where high levels of information security are required. While the cost to interface electronic and optical light signals and to terminate and connect optical fiber remains comparatively high, we expect that in future years the cost difference versus traditional copper networks will diminish. We sell fiber optic infrastructure, and many customers specify these products in combination with copper-based infrastructure. The final stage of most networks remains almost exclusively copper-based, and we expect that it will continue to be copper for the foreseeable future. However, if a significant decrease in the cost of fiber optic systems relative to the cost of copper-based systems were to occur, such systems could become superior on a price/performance basis to copper-based systems. Part of our research and development efforts focus on expanding our fiber-optic based product portfolio.

Patents and Trademarks

We have a policy of seeking patents when appropriate on inventions concerning new products, product improvements, and advances in equipment and processes as part of our ongoing research, development, and manufacturing activities. We own many patents and registered trademarks worldwide that are used by our operating segments, with pending applications for numerous others. We consider our patents and trademarks to be valuable assets. Our most prominent trademarks are: Belden®, Alpha Wire™, Mohawk®, West Penn Wire™, Hirschmann®, Lumberg Automation™, GarrettCom®, Poliron™, Tofino®, PPC®, Grass Valley®, ProSoft Technology®, Tripwire®, and Thinklogical®.

Raw Materials

The principal raw material used in many of our cable products is copper. Other materials we purchase in large quantities include fluorinated ethylene-propylene (FEP), polyvinyl chloride (PVC), polyethylene, aluminum-clad steel and copper-clad steel conductors, aluminum, brass, other metals, optical fiber, printed circuit boards, and electronic components. With respect to all major raw materials used by us, we generally have either alternative sources of supply or access to alternative materials. Supplies of these materials are generally adequate and are expected to remain so for the foreseeable future.

Over the past three years, the prices of metals, particularly copper, have been highly volatile. The chart below illustrates the high and low spot prices per pound of copper over the last three years.

	2018	2017	2016
Copper spot prices per pound			
High	$3.29	$3.29	$2.69
Low	$2.56	$2.48	$1.94

Prices for materials such as PVC and other plastics derived from petrochemical feedstocks have also fluctuated. Since Belden utilizes the first in, first out (FIFO) inventory costing methodology, the impact of copper and other raw material cost changes on our cost of goods sold is delayed by approximately two months based on our rate of inventory turnover.

While we generally are able to adjust our pricing for fluctuations in commodity prices, we can experience short-term favorable or unfavorable variances. When the cost of raw materials increases, we are generally able to recover these costs through higher pricing of our finished products. The majority of our products are sold through distribution, and we manage the pricing of these products through published price lists, which we update from time to time, with new prices typically taking effect a few weeks after they are announced. Some OEM customer contracts have provisions for passing through raw material cost changes, generally with a lag of a few weeks to three months.

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Backlog

Our business is characterized generally by short-term order and shipment schedules. Our backlog consists of product orders for which we have received a customer purchase order or purchase commitment and which have not yet been shipped. Orders are generally subject to cancellation or rescheduling by the customer. As of December 31, 2018, our backlog of orders believed to be firm was $287.9 million. The majority of the backlog at December 31, 2018 is scheduled to be shipped in 2019.

Environmental Matters

We are subject to numerous federal, state, provincial, local, and foreign laws and regulations relating to the storage, handling, emission, and discharge of materials into the environment, including the Comprehensive Environmental Response, Compensation, and Liability Act; the Clean Water Act; the Clean Air Act; the Emergency Planning and Community Right-To-Know Act; the Resource Conservation and Recovery Act; and similar laws in the other countries in which we operate. We believe that our existing environmental control procedures and accrued liabilities are adequate, and we have no current plans for substantial capital expenditures in this area.

Employees

As of December 31, 2018, we had approximately 9,000 employees worldwide. We also utilized approximately 400 workers under contract manufacturing arrangements. Approximately 1,900 employees are covered by collective bargaining agreements at various locations around the world. We believe our relationship with our employees is generally good.

Available Information

We file annual, quarterly, and current reports, proxy statements, and other information with the Securities and Exchange Commission (SEC). These reports, proxy statements, and other information contain additional information about us. These electronic SEC filings are available on the SEC's web site at www.sec.gov.

Belden maintains an Internet web site at www.belden.com where our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, proxy statements, and all amendments to those reports and statements are available without charge, as soon as reasonably practicable following the time they are filed with or furnished to the SEC.

We will provide upon written request and without charge a printed copy of our Annual Report on Form 10-K. To obtain such a copy, please write to the Corporate Secretary, Belden Inc., 1 North Brentwood Boulevard, 15th Floor, St. Louis, MO 63105.

Executive Officers

The following table sets forth certain information with respect to the persons who were Belden executive officers as of February 19, 2019. All executive officers are elected to terms that expire at the organizational meeting of the Board of Directors following the Annual Meeting of Shareholders.

Name	Age	Position
John Stroup	52	President, Chief Executive Officer, and Chairman
Brian Anderson	44	Senior Vice President, Legal, General Counsel and Corporate Secretary
Henk Derksen	50	Senior Vice President, Finance, and Chief Financial Officer
Leo Kulmaczewski	53	Senior Vice President, Operations and Lean Enterprise
Dean McKenna	50	Senior Vice President, Human Resources
Glenn Pennycook	56	Executive Vice President, Enterprise Solutions
Ross Rosenberg	49	Senior Vice President, Strategy and Corporate Development
Dhrupad Trivedi	52	Executive Vice President, Chief Technology Officer and President, Tripwire
Paul Turner	55	Senior Vice President, Sales
Roel Vestjens	44	Executive Vice President, Industrial Solutions
Doug Zink	43	Vice President and Chief Accounting Officer

John Stroup has been President, Chief Executive Officer and a member of the Board since October 2005. He was elected as Chairman of the Board on November 30, 2016. From 2000 to the date of his appointment with the Company, he was employed

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by Danaher Corporation, a manufacturer of professional instrumentation, industrial technologies, and tools and components. At Danaher, he initially served as Vice President, Business Development. He was promoted to President of a division of Danaher's Motion Group and later to Group Executive of the Motion Group. Earlier, he was Vice President of Marketing and General Manager with Scientific Technologies Inc. He has a B.S. in Mechanical Engineering from Northwestern University and an M.B.A. from the University of California at Berkeley Haas School of Business.

Brian Anderson has been Senior Vice President, Legal, General Counsel and Corporate Secretary since April 2015. Prior to that, he served as Corporate Attorney for the Company from May 2008 through March 2015. Prior to joining Belden, Mr. Anderson was in private practice at the law firm Lewis Rice. Mr. Anderson has a B.S.B. in Accounting and an M.B.A. from Eastern Illinois University and holds a J.D. from Washington University in St. Louis.

Henk Derksen has been Senior Vice President, Finance, and Chief Financial Officer since January 2012. Prior to that, he served as Vice President, Corporate Finance from July 2011 to December 2011 and Treasurer and Vice President, Financial Planning and Analysis of the Company from January 2010 to July 2011. In August of 2003, he became Vice President, Finance for the Company's EMEA division, after joining the Company at the end of 2000. Prior to joining the Company, he was Vice President and Controller of Plukon Poultry, a food processing company from 1998 to 2000, and has 5 years' experience in public accounting with Price Waterhouse and Baker Tilly. Mr. Derksen has a M.A. in Accounting from the University of Arnhem in the Netherlands and holds a doctoral degree in Business Economics in addition to an Executive Master of Finance & Control from Tias Business School in the Netherlands.

Leo Kulmaczewski was appointed Senior Vice President, Operations and Lean Enterprise in October 2018. Prior to joining Belden, Mr. Kulmaczewski was employed by Leica Biosystems, a division of Danaher Corporation, in various operations roles in the medical devices industry, the most recent of which was Vice President, Operations, Global Supply Chain and Danaher Business System. Prior to joining Leica in 2014, he worked for Thermo Fisher Scientific, Honeywell and Motorola, among other companies. Mr. Kulmaczewski has a B.S. in Industrial Engineering from the University of Wisconsin and an M.B.A. from DePaul University.

Dean McKenna was appointed Senior Vice President, Human Resources in May 2015. Prior to joining Belden, he was Vice President of Human Resources for the international business of SC Johnson. Prior to SC Johnson, he worked in various senior international human resource, organizational development and talent positions at Ingredion, Akzo Nobel and ICI Group PLC. He received his degree in Strategic Human Resource Management at the Nottingham Business School in the United Kingdom.

Glenn Pennycook has been Executive Vice President, Enterprise Solutions since February 2018. Prior to that, Mr. Pennycook was Executive Vice President, Enterprise Solutions and Broadband Solutions from February 2017 to February 2018 and Executive Vice President, Enterprise Solutions from May 2013 to February 2017. Before serving in that role, Mr. Pennycook as President of the Enterprise Solutions Division, after joining Belden in November 2008. Prior to joining the Company, he spent 5 years with Pregis Corporation as Director of Operations for Protective Packaging Europe, and was promoted to Managing Director for Western Europe in 2005. He has a degree in Chemical Engineering from McMaster University, Hamilton Ontario, Canada.

Ross Rosenberg was appointed Senior Vice President of Strategy & Corporate Development at the Company in February 2013, and became an executive officer in May 2014. Prior to joining the Company, he led corporate development and global marketing at First Solar, the world's largest provider of utility-scale solar power plant solutions. Prior to First Solar, Mr. Rosenberg ran a division of Danaher, a large diversified industrial technology company. At Danaher, he held several executive management roles, as well as vice president, marketing for a division and group vice president, strategy and business development. Mr. Rosenberg holds a B.S. in Accounting from University of Illinois, an M.B.A. from The Wharton School at the University of Pennsylvania and is a Certified Public Accountant.

Dhrupad Trivedi has been Executive Vice President, Chief Technology Officer and President, Tripwire since February 2018. Prior to that, Mr. Trivedi was Executive Vice President, Network Solutions from January 2017 to February 2018, Executive Vice President of the former Network Security Solutions segment from August 2016 to January 2017 and Executive Vice President of the former Industrial IT Solutions segment from April 2013 to August 2016. Mr. Trivedi fulfilled other corporate development, strategy and general management roles in his earlier Belden career dating back to January 2010. Prior to joining the Company, he was responsible for General Management and Corporate Development roles at JDS Uniphase. Mr. Trivedi has an MBA from Duke University and a Ph.D. in Electrical Engineering from University of Massachusetts, Amherst.

Paul Turner has been Senior Vice President, Sales since February 2017. Mr. Turner joined Belden in 2006, and has held a variety of roles of increasing responsibility within Belden’s sales organization since that time. Before joining Belden, Mr. Turner spent five years in the private sector in a subcontract manufacturing company based in the United Kingdom, ultimately serving in the post of Managing Director. Prior to that experience, Mr. Turner spent 13 years with the 3M Company in the United Kingdom, holding roles of increasing responsibility within 3M’s commercial organization across the EMEA region.

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Roel Vestjens has been Executive Vice President, Industrial Solutions since February 2018. Prior to that, he was the Executive Vice President, Industrial Solutions and Broadcast IT Solutions from January 2017 to February 2018 and the Executive Vice President, Broadcast Solutions from March 2014 to January 2017. Mr. Vestjens joined Belden in 2006 as Director of Marketing for the EMEA region. In April 2008, Mr. Vestjens was promoted to Director of Sales and Marketing for the Industrial Solutions business, and in January 2009, he was appointed General Manager of Belden’s Wire and Cable Systems business in EMEA. Mr. Vestjens relocated to Asia in November 2010, and became President of the APAC OEM business, followed by President of all APAC Operations in May 2012. Mr. Vestjens joined Belden from Royal Philips Electronics where he held various European sales and marketing positions. Mr. Vestjens holds a bachelor degree in Electrical Engineering and a Master of Science and Management degree from Nyenrode Business University in the Netherlands.

Doug Zink has been Vice President and Chief Accounting Officer since September 2013. Prior to that, he has served as the Company’s Vice President, Internal Audit; Corporate Controller; and Director of Financial Reporting, after joining Belden in May 2007. Prior to joining the Company, he was a Financial Reporting Manager at TLC Vision Corporation, an eye care service company, from 2004 to 2007, and has five years of experience in public accounting with KPMG LLP and Arthur Andersen LLP. He holds Bachelor’s and Master’s Degrees in Accounting from Texas Christian University and is a Certified Public Accountant.

Cautionary Information Regarding Forward-Looking Statements

We make forward-looking statements in this Annual Report on Form 10-K, in other materials we file with the SEC or otherwise release to the public, and on our website. In addition, our senior management might make forward-looking statements orally to investors, analysts, the media, and others. Statements concerning our future operations, prospects, strategies, financial condition, future economic performance (including growth and earnings) and demand for our products and services, and other statements of our plans, beliefs, or expectations, including the statements contained in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” that are not historical facts, are forward-looking statements. In some cases these statements are identifiable through the use of words such as “anticipate,” “believe,” “estimate,” “forecast,” “guide,” “expect,” “intend,” “plan,” “project,” “target,” “can,” “c “should,” “will,” “would,” and similar expressions. The forward-looking statements we make are not guarantees of future performance and are subject to various assumptions, risks, and other factors that could cause actual results to differ materially from those suggested by these forward-looking statements. These factors include, among others, those set forth in the following section and in the other documents that we file with the SEC.

We expressly disclaim any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

Item 1A. Risk Factors

Following is a discussion of some of the more significant risks that could materially impact our business. There may be additional risks that impact our business that we currently do not recognize as, or that are not currently, material to our business.

We may be unable to achieve our goals related to growth.

In order to meet the goals in our strategic plan, we must grow our business, both organically and through acquisitions. Our goal is to generate total revenue growth of 5-7% per year in constant currency. We may be unable to achieve this desired growth due to a failure to identify growth opportunities, such as trends and technological changes in our end markets. We may ineffectively execute our Market Delivery System (“MDS”), which is designed to identify and capture growth opportunities. The broadcast, enterprise, and industrial end markets we serve may not experience the growth we expect. Further, those markets may be unable to sustain growth on a long-term basis, particularly in emerging markets. If we are unable to achieve our goals related to growth, it could have a material adverse effect on our results of operations, financial position, and cash flows.

We may be unable to implement our strategic plan successfully.

Our strategic plan is designed to continually enhance shareholder value by improving revenues and profitability, reducing costs, and improving working capital management. To achieve these goals, our strategic priorities are reliant on our Belden Business System, which includes continuing deployment of our MDS to capture market share through end-user engagement, channel management, outbound marketing, and careful vertical market selection; improving our recruitment and development of talented associates; developing strong global business platforms; acquiring businesses that fit our strategic plan; and becoming a leading Lean company. We have a disciplined process for deploying this strategic plan through our associates. There is a risk that we may not be successful in developing or executing these measures to achieve the expected results for a variety of reasons, including market developments, economic conditions, shortcomings in establishing appropriate action plans, or challenges with executing multiple initiatives simultaneously. For example, our MDS initiative may not succeed or we may lose market share due to challenges in choosing the right products to market or the right customers for these products, integrating products of acquired companies into our sales and marketing strategy, or strategically bidding against OEM partners. We may fail to identify growth opportunities. We may not be able to acquire businesses that fit our strategic plan on acceptable business terms, and we may not achieve our other strategic priorities.

We may be unable to achieve our strategic priorities in emerging markets.

Emerging markets are a significant focus of our strategic plan. The developing nature of these markets presents a number of risks. We may be unable to attract, develop, and retain appropriate talent to manage our businesses in emerging markets. Deterioration of social, political, labor, or economic conditions in a specific country or region may adversely affect our operations or financial results. Emerging markets may not meet our growth expectations, and we may be unable to maintain such growth or to balance such growth with financial goals and compliance requirements. Among the risks in emerging market countries are bureaucratic intrusions and delays, contract compliance failures, engrained business partners that do not comply with local or U.S. law, such as the Foreign Corrupt Practices Act, fluctuating currencies and interest rates, limitations on the amount and nature of investments, restrictions on permissible forms and structures of investment, unreliable legal and financial infrastructure, regime disruption and political unrest, uncontrolled inflation and commodity prices, fierce local competition by companies with better political connections, and corruption. In addition, the costs of compliance with local laws and regulations in emerging markets may negatively impact our competitive position as compared to locally owned manufacturers.

The increased influence of chief information officers and similar high-level executives may negatively impact demand for our products.

As a result of the increasing interconnectivity of a wide variety of systems, chief information officers and similar executives are becoming more heavily involved in operation areas that have not historically been associated with information technology. As a result, CIOs and IT departments are exercising increased influence over the procurement and purchasing process at the expense of engineers, plant managers and operation personnel that have historically driven demand for many of our products. When making purchasing decisions, CIO’s often value interoperability, standardization, cloud-readiness and security over domain expertise and niche application knowledge. As a result of the increasing influences of CIOs and IT departments, we may face increased competition from IT-industry companies that have not traditionally had major presences in the markets in which we operate. Further, the variance in considerations that drive purchasing decisions between CIOs and those with niche application expertise may result in increased competition based on price and a reduction in demand for our products.

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The presence of substitute products in the marketplace may reduce demand for our products and negatively impact our business.

Fiber optic systems are increasingly substitutable for copper based cable systems. Customers may shift demand to fiber optic systems with greater capabilities than copper based cable systems, leading to a reduction in demand for copper based cable. We may not be able to offset the effects of a reduction in demand for our copper-based cable systems with an increase in demand for our existing fiber optic systems. Further, the supply chain in the fiber market is highly constrained, with a small number of vertically integrated firms controlling critical inputs and the related intellectual property. Similarly, in our non-cable businesses, customers could rapidly shift the methods by which they capture and transmit signals in ways that could lead to decreased demand for our current or future products. These factors, either together or in isolation, may negatively impact revenue and profitability.

Our future success depends in part on our ability to develop and introduce new products and respond to changes in customer preferences.

Our markets are characterized by the introduction of products with increasing technological capabilities. Our success depends in part on our ability to anticipate and offer products that appeal to the changing needs and preferences of our customers in the various markets we serve. Developing new products and adapting existing products to meet evolving customer expectations requires high levels of innovation, and the development process may be lengthy and costly. If we are not able to anticipate, identify, develop and market products that respond to changes in customer preferences, demand for our products could decline.

The relative costs and merits of our solutions could change in the future as various competing technologies address the market opportunities. We believe that our future success will depend in part upon our ability to enhance existing products and to develop and manufacture new products that meet or anticipate technological changes, which will require continued investment in engineering, research and development, capital equipment, marketing, customer service, and technical support. We have long been successful in introducing successive generations of more capable products, but if we were to fail to keep pace with technology or with the products of competitors, we might lose market share and harm our reputation and position as a technology leader in our markets. See the discussion above in Part I, Item 1, under Research and Development.

The increased prevalence of cloud computing may negatively impact certain aspects of our business.

The nature in which many of our products are purchased or used is evolving with the increasing prevalence of cloud computing and other methods of off-premises computing and data storage. This may negatively impact one or more of our businesses in a number of ways, including:

•Consolidation of procurement power leading to the commoditization of IT products;
•Reduction in the demand for infrastructure products previously used to support on-site data centers;
•Lowering barriers to entry for certain markets, leading to new market entrants and enhanced competition;
•Preferences for software as a service billing and pricing models may reduce demand for non-cloud “packaged” software.

Alterations to our product mix and go-to-market strategies designed to respond to the changes in the marketplace presented by cloud computing may be disruptive to our business and lead to increase expenses, which may result in lower revenues and profitability. Further, if a competitor is able to more quickly or efficiently adapt, or if cloud computing results in significantly lower barriers to entry and new competitors enter our markets, demand for our products may be reduced.

We must complete further acquisitions in order to achieve our strategic plan.

In order to meet the goals in our strategic plan, we must complete further acquisitions. The extent to which appropriate acquisitions are made will affect our overall growth, operating results, financial condition, and cash flows. Our ability to acquire businesses successfully will decline if we are unable to identify appropriate acquisition targets consistent with our strategic plan, the competition among potential buyers increases, the cost of acquiring suitable businesses becomes too expensive, or we lack sufficient sources of capital. As a result, we may be unable to make acquisitions or be forced to pay more or agree to less advantageous acquisition terms for the companies that we are able to acquire.

We may have difficulty integrating the operations of acquired businesses, which could negatively affect our results of operations and profitability.

We may have difficulty integrating acquired businesses and future acquisitions might not meet our performance expectations. Some of the integration challenges we might face include differences in corporate culture and management styles, additional or conflicting governmental regulations, compliance with the Sarbanes-Oxley Act of 2002, financial reporting that is not in compliance with U.S. generally accepted accounting principles, disparate company policies and practices, customer relationship issues, and retention of key personnel. In addition, management may be required to devote a considerable amount of time to the integration process, which could decrease the amount of time we have to manage the other businesses. We may not be able to integrate

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operations successfully or cost-effectively, which could have a negative impact on our results of operations or our profitability. The process of integrating operations could also cause some interruption of, or the loss of momentum in, the activities of acquired businesses.

Our results of operations are subject to foreign and domestic political, economic, and other uncertainties and are affected by changes in currency exchange rates.

In addition to manufacturing and other operating facilities in the U.S., we have manufacturing and other operating facilities in Brazil, Canada, China, India, Japan, Mexico, St. Kitts, and several European countries. We rely on suppliers in many countries, including China. Our foreign operations are subject to economic and political risks inherent in maintaining operations abroad such as economic and political destabilization, land use risks, international conflicts, restrictive actions by foreign governments, and adverse foreign tax laws. In addition to economic and political risk, a risk associated with our European manufacturing operations is the higher relative expense and length of time required to adjust manufacturing employment capacity. We also face political risks in the U.S., including tax or regulatory risks or potential adverse impacts from legislative impasses over, or significant legislative, regulatory or executive changes in fiscal or monetary policy and other foreign and domestic government policies, including, but not limited to, trade policies and import/export policies.

Approximately 49% of our sales are outside the U.S. Other than the U.S. dollar, the principal currencies to which we are exposed through our manufacturing operations, sales, and related cash holdings are the euro, the Canadian dollar, the Hong Kong dollar, the Chinese yuan, the Japanese yen, the Mexican peso, the Australian dollar, the British pound, and the Brazilian real. Generally, we have revenues and costs in the same currency, thereby reducing our overall currency risk, although any realignment of our manufacturing capacity among our global facilities could alter this balance. When the U.S. dollar strengthens against other currencies, the results of our non-U.S. operations are translated at a lower exchange rate and thus into lower reported revenues and earnings.

Changes in tax laws may adversely affect our financial position.

We are a U.S.-based multinational company subject to tax in multiple U.S. and foreign tax jurisdictions. Significant judgment is required in determining our global provision for income taxes, deferred tax assets or liabilities and in evaluating our tax positions on a worldwide basis. While we believe our tax positions are consistent with the tax laws in the jurisdictions in which we conduct our business, it is possible that these positions may be contested or overturned by jurisdictional tax authorities, which may have a significant impact on our global provision for income taxes.

Tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. The U.S. recently enacted significant tax reform, and certain provisions of the new law may adversely affect us. In addition, governmental tax authorities are increasingly scrutinizing the tax positions of companies. Many countries in the European Union, as well as a number of other countries and organizations such as the Organization for Economic Cooperation and Development, are actively considering changes to existing tax laws. If tax laws and related regulations change, our financial results could be materially impacted. Given the unpredictability of these possible changes and their potential interdependency, it is possible such changes could adversely impact our financial results.

We may experience significant variability in our quarterly and annual effective tax rate which would affect our reported net income.

We have a complex tax profile due to the global nature of our operations, which encompass multiple taxing jurisdictions. Variability in the mix and profitability of domestic and international activities, identification and resolution of various tax uncertainties, changes in tax laws and rates, and the extent to which we are able to realize net operating loss and other carryforwards included in deferred tax assets and avoid potential adverse outcomes included in deferred tax liabilities, among other matters, may significantly affect our effective income tax rate in the future.

Our effective income tax rate is the result of the income tax rates in the various countries in which we do business. Our mix of income and losses in these jurisdictions affects our effective tax rate. For example, relatively more income in higher tax rate jurisdictions would increase our effective tax rate and thus lower our net income. Similarly, if we generate losses in tax jurisdictions for which no benefits are available; our effective income tax rate will increase. Our effective income tax rate may also be impacted by the recognition of discrete income tax items, such as required adjustments to our liabilities for uncertain tax positions or our deferred tax asset valuation allowance. A significant

increase in our effective income tax rate could have a material adverse impact on our earnings.
Of our $420.6 million cash and cash equivalents balance as of December 31, 2018, $184.1 million was held outside of the U.S. in our foreign operations. The Tax Cuts and Jobs Act of 2017 included a one-time transition tax of unremitted foreign earnings,

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and accordingly, in the fourth quarter of 2018 we recorded a final adjustment to the tax expense related to the transition tax on the one-time mandatory deemed repatriation of all our foreign earnings as of December 31, 2017. See Note 15 Income Taxes in the accompanying notes to our consolidated financial statements.

Changes in global tariffs and trade agreements may have a negative impact on global economic conditions, markets and our business.

Like most multinational companies, we have supply chains and sales channels that extend beyond national borders. Purchasing and production decisions in some cases are largely influenced by the trade agreements and the tax and tariff structures in place. Disruption in those structures can create significant market uncertainty. While the impact of Brexit and the announced U.S. and Chinese tariff actions are not expected to be material to us, unanticipated complications in the free movement of goods in Europe, an escalation of tariff activity anywhere in the world or changes to existing free trade agreements could materially impact our financial results. In addition to the potential direct impacts of free trade restrictions, longer term macroeconomic consequences could result, including slower growth, inflation, higher interest rates and unfavorable impacts to currency exchange rates. Any of these factors could have a material adverse effect on our business, financial condition and results of operations.

Our revenue for any particular period can be difficult to forecast.

Our revenue for any particular period can be difficult to forecast, especially in light of the challenging and inconsistent global macroeconomic environment and related market uncertainty. Our revenue may grow at a slower rate than in past periods or even decline on a year-over-year basis. Changes in market growth rates can have a significant effect on our operating results.

The timing of orders for customer projects can also have a significant effect on our operating results in the period in which the products are shipped and recognized as revenue. The timing of such projects is difficult to predict, and the timing of revenue recognition from such projects may affect period to period changes in revenue. As a result, our operating results could vary materially from quarter to quarter based on the receipt of such orders and their ultimate recognition as revenue. Similarly, we are often informed by our customers well in advance that such customer intends to place an order related to a specific project in a given quarter. Such a customer’s timeline for execution of the project, and the resulting purchase order, may be unexpectedly delayed to a future quarter, or cancelled. The frequency of such delays can be difficult to predict. As a result, it is difficult to precisely forecast revenue and operating results for future quarters.

In addition, our revenue can be difficult to forecast due to unexpected changes in the level of our products held as inventory by our channel partners and customers. Our channel partners and customers purchase and hold our products in their inventory in order to meet the service and on-time delivery requirements of their customers. As our channel partners and customers change the level of Belden products owned and held in their inventory, our revenue is impacted. As we are dependent upon our channel partners and customers to provide us with information regarding the amount of our products that they own and hold in their inventory, unexpected changes can occur and impact our revenue forecast.

A challenging global economic environment or a downturn in the markets we serve could adversely affect our operating results and stock price in a material manner.

A challenging global economic environment could cause substantial reductions in our revenue and results of operations as a result of weaker demand by the end users of our products and price erosion. Price erosion may occur through competitors becoming more aggressive in pricing practices. A challenging global economy could also make it difficult for our customers, our vendors, and us to accurately forecast and plan future business activities. Our customers could also face issues gaining timely access to sufficient credit, which could have an adverse effect on our results if such events cause reductions in revenues, delays in collection, or write-offs of receivables. Further, the demand for many of our products is economically sensitive and will vary with general economic activity, trends in nonresidential construction, investment in manufacturing facilities and automation, demand for information and broadcast technology equipment, and other economic factors.

Global economic uncertainty could result in a significant decline in the value of foreign currencies relative to the U.S. dollar, which could result in a significant adverse effect on our revenues and results of operations; could make it difficult for our customers and us to accurately forecast and plan future business activities; and could cause our customers to slow or reduce spending on our products and services. Economic uncertainty could also arise from fiscal policy changes in the countries in which we operate.

Changes in foreign currency rates and commodity prices can impact the buying power of our customers. For example, a strengthened U.S. dollar can result in relative price increases for our products for customers outside of the U.S., which can have a negative impact on our revenues and results of operations. Furthermore, customers' ability to invest in capital expenditures, such as our products, can depend upon proceeds from commodities, such as oil and gas markets. A decline in energy prices, therefore, can have a negative impact on our revenues and results of operations.

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The global markets in which we operate are highly competitive.

We face competition from other manufacturers for each of our global business platforms and in each of our geographic regions. These companies compete on price, reputation and quality, product technology and characteristics, and terms. Some multinational competitors have greater engineering, financial, manufacturing, and marketing resources than we have. Actions that may be taken by competitors, including pricing, business alliances, new product introductions, market penetration, and other actions, could have a negative effect on our revenues and profitability. Moreover, some competitors that are highly leveraged both financially and operationally could become more aggressive in their pricing of products.

Volatility of credit markets could adversely affect our business.

Uncertainty in U.S. and global financial and equity markets could make it more expensive for us to conduct our operations and more difficult for our customers to buy our products. Additionally, market volatility or uncertainty may cause us to be unable to pursue or complete acquisitions. Our ability to implement our business strategy and grow our business, particularly through acquisitions, may depend on our ability to raise capital by selling equity or debt securities or obtaining additional debt financing. Market conditions may prevent us from obtaining financing when we need it or on terms acceptable to us.

Changes in the price and availability of raw materials we use could be detrimental to our profitability.

Copper is a significant component of the cost of most of our cable products. Over the past few years, the prices of metals, particularly copper, have been volatile. Prices of other materials we use, such as polyvinylchloride (PVC) and other plastics derived from petrochemical feedstocks, have also been volatile. Generally, we have recovered much of the higher cost of raw materials through higher pricing of our finished products. The majority of our products are sold through distribution, and we manage the pricing of these products through published price lists which we update from time to time, with new prices typically taking effect a few weeks after they are announced. Some OEM contracts have provisions for passing through raw material cost changes, generally with a lag of a few weeks to three months. If we are unable to raise prices sufficiently to recover our material costs, our earnings could decline. If we raise our prices but competitors raise their prices less, we may lose sales, and our earnings could decline. If the price of copper were to decline, we may be compelled to reduce prices to remain competitive, which could have a negative effect on revenues. While we generally believe the supply of raw materials (copper, plastics, and other materials) is adequate, we have experienced instances of limited supply of certain raw materials, resulting in extended lead times and higher prices. If a supply interruption or shortage of materials were to occur (including due to labor or political disputes), this could have a negative effect on revenues and earnings.

Future operating results depend upon the Company’s ability to obtain components in sufficient quantities on commercially reasonable terms.

Because the Company currently obtains certain components from single or limited sources, the Company is subject to significant supply and pricing risks. Many components, including those that are available from multiple sources, are at times subject to industry-wide shortages that could materially adversely affect the Company’s financial condition and operating results. While the Company has entered into agreements for the supply of many components, there can be no assurance that the Company will be able to extend or renew these agreements on similar terms, or at all. Component suppliers may suffer from poor financial conditions, which can lead to business failure for the supplier or consolidation within a particular industry, further limiting the Company’s ability to obtain sufficient quantities of components on commercially reasonable terms. If the Company’s supply of components for a new or existing product were delayed or constrained, or if an outsourcing partner delayed shipments of completed products to the Company, the Company’s financial condition and operating results could be materially adversely affected. The Company’s business and financial performance could also be materially adversely affected depending on the time required to obtain sufficient quantities from the original source, or to identify and obtain sufficient quantities from an alternative source.

Potential problems with our information systems could interfere with our business and operations.

We rely on our information systems and those of third parties for storing proprietary company information about our products and intellectual property, as well as for processing customer orders, manufacturing and shipping products, billing our customers, tracking inventory, supporting accounting functions and financial statement preparation, paying our employees, and otherwise running our business. Any disruption, whether from hackers or other sources, in our information systems or those of the third parties upon whom we rely could have a significant impact on our business. In addition, we may need to enhance our information systems to provide additional capabilities and functionality. The implementation of new information systems and enhancements is frequently disruptive to the underlying business of an enterprise. Any disruptions affecting our ability to accurately report our financial performance on a timely basis could adversely affect our business in a number of respects. If we are unable to successfully implement potential future information systems enhancements, our financial position, results of operations, and cash flows could be negatively impacted.

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We, and others on our behalf, store “personally identifiable information” (“PII”) with respect to employees, vendors, customers, and others. While we have implemented safeguards to protect the privacy of this information, it is possible that hackers or others might obtain this information. If that occurs, in addition to having to take potentially costly remedial action, we also may be subject to fines, penalties, lawsuits, and reputational damage.

Perceived failure of our signal transmission solutions to provide expected results may result in negative publicity and harm our business and operating results.

Our customers use our signal transmission solutions in a wide variety of IT systems and application environments in order to help reduce security vulnerabilities and demonstrate compliance. Despite our efforts to make clear in our marketing materials and customer agreements the capabilities and limitations of these products, some customers may incorrectly view the deployment of such products in their IT infrastructure as a guarantee that there will be no security breach or policy non-compliance event. As a result, the occurrence of a high profile security breach, or a failure by one of our customers to pass a regulatory compliance IT audit, could result in public and customer perception that our solutions are not effective and harm our business and operating results, even if the occurrence is unrelated to the use of such products or if the failure is the result of actions or inactions on the part of the customer.

Our use of open source software could negatively impact our ability to sell our products and may subject us to unanticipated obligations.

The products, services, or technologies we acquire, license, provide, or develop may incorporate or use open source software. We monitor and restrict our use of open source software in an effort to avoid unintended consequences, such as reciprocal license grants, patent retaliation clauses, and the requirement to license our products at no cost. Nevertheless, we may be subject to unanticipated obligations regarding our products which incorporate or use open source software.

Our revenue and profits would likely decline, at least temporarily, if we were to lose a key distributor.

We rely on several key distributors in marketing our products. Distributors purchase the products of our competitors along with our products. Our largest distributor, Anixter International Inc., accounted for 12% of our revenue in 2018 and our top six distributors, including Anixter, accounted for a total of 22% of our revenue in 2018. If we were to lose one of these key distributors, our revenue and profits would likely decline, at least temporarily. Changes in the inventory levels of our products owned and held by our distributors can result in significant variability in our revenues. Further, certain distributors are allowed to return certain inventory in exchange for an order of equal or greater value. We have recorded reserves for the estimated impact of these inventory policies.

Consolidation of our distributors, particularly where the survivor relies more heavily on our competitors, could adversely impact our revenues and earnings. It could also result in consolidation of distributor inventory, which would temporarily depress our revenues. We have also experienced financial failure of distributors from time to time, resulting in our inability to collect accounts receivable in full. A global economic downturn could cause financial difficulties (including bankruptcy) for our distributors and other customers, which would adversely affect our results of operations.

If we are unable to retain senior management and key employees, our business operations could be adversely affected.

Our success has been largely dependent on the skills, experience, and efforts of our senior management and key employees. The loss of any of our senior management or other key employees, for example sales and product development employees, could have an adverse effect on us. We may not be able to find qualified replacements for these individuals and the integration of potential replacements may be disruptive to our business. More broadly, a key determinant of our success is our ability to attract, develop, and retain talented associates. While this is one of our strategic priorities, we may not be able to succeed in this regard.

We might have difficulty protecting our intellectual property from use by competitors, or competitors might accuse us of violating their intellectual property rights.

Disagreements about patents and other intellectual property rights occur in the markets we serve. Third parties have asserted and may in the future assert claims of infringement of intellectual property rights against us or against our customers or channel partners for which we may be liable. Furthermore, a successful claimant could secure a judgment that requires us to pay substantial damages or prevents us from distributing certain products or performing certain services. We may encounter difficulty enforcing our own intellectual property rights against third parties, which could result in price erosion or loss of market share.

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We are subject to laws and regulations worldwide, changes to which could increase our costs and individually or in the aggregate adversely affect our business.

We are subject to laws and regulations affecting our domestic and international operations in a number of areas. These U.S. and foreign laws and regulations affect our activities including, but not limited to, in areas of labor, advertising, real estate, billing, e-commerce, promotions, quality of services, property ownership and infringement, tax, import and export requirements, anti-corruption, foreign exchange controls and cash repatriation restrictions, data privacy requirements, anti-competition, environmental, health and safety.

Compliance with these laws, regulations and similar requirements may be onerous and expensive, and they may be inconsistent from jurisdiction to jurisdiction, further increasing the cost of compliance and doing business. Any such costs, which may rise in the future as a result of changes in these laws and regulations or in their interpretation, could individually or in the aggregate make our products and services less attractive to our customers, delay the introduction of new products in one or more regions, or cause us to change or limit our business practices. We have implemented policies and procedures designed to ensure compliance with applicable laws and regulations, but there can be no assurance that our employees, contractors, or agents will not violate such laws and regulations or our policies and procedures.

Specifically with respect to data privacy, the European Commission has approved a data protection regulation, known as the General Data Protection Regulation (GDPR), which became effective in May 2018. The GDPR includes operational requirements for companies that receive or process personal data of residents of the European Union that are different than those previously in place in the European Union, and includes significant penalties for non-compliance. In addition, some countries are considering or have passed legislation implementing data protection requirements or requiring local storage and processing of data or similar requirements that could increase the cost and complexity of delivering our services.

If our goodwill or other intangible assets become impaired, we would be required to recognize charges that would reduce our income.

Under accounting principles generally accepted in the U.S., goodwill and certain other intangible assets are not amortized but must be reviewed for possible impairment annually or more often in certain circumstances if events indicate that the asset values may not be recoverable. We have incurred significant charges for the impairment of goodwill and other intangible assets in the past, and we may be required to do so again in future periods if the underlying value of our business declines. Such a charge would reduce our income without any change to our underlying cash flows.

Some of our employees are members of collective bargaining groups, and we might be subject to labor actions that would interrupt our business.

Some of our employees, primarily outside the U.S., are members of collective bargaining groups. We believe that our relations with employees are generally good. However, if there were a dispute with one of these bargaining groups, the affected operations could be interrupted, resulting in lost revenues, lost profit contribution, and customer dissatisfaction.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Belden owns and leases manufacturing, warehousing, sales, and administrative space in locations around the world. We also have a corporate office that we lease in St. Louis, Missouri. The leases are of varying terms, expiring from 2019 through 2028.

The table below summarizes the geographic locations of our manufacturing and other operating facilities utilized by our segments as of December 31, 2018.

	Enterprise Solutions	Industrial Solutions	Utilized by Multiple Segments	Total
Brazil	—	1	—	1
Canada	1	1	—	2
China	1	—	1	2
Czech Republic	—	1	—	1
Denmark	2	—	—	2
Germany	—	4	—	4
Hungary	—	—	1	1
Italy	—	—	1	1
Japan	1	—	—	1
Mexico	1	—	2	3
Netherlands	1	1	—	2
St. Kitts	1	—	—	1
United Kingdom	3	—	—	3
United States	5	6	2	13
Total	16	14	7	37

In addition to the manufacturing and other operating facilities summarized above, our segments also utilize approximately 30 warehouses worldwide. As of December 31, 2018, we owned or leased a total of approximately 7 million square feet of facility space worldwide. We believe that our production facilities are suitable for their present and intended purposes and adequate for our current level of operations.

Item 3. Legal Proceedings

PPC Broadband, Inc. v. Corning Optical Communications RF, LLC - On July 5, 2011, the Company's wholly-owned subsidiary, PPC Broadband, Inc. ("PPC"), filed an action for patent infringement in the U.S. District Court for the Northern District of New York against Corning Optical Communications RF LLC ("Corning"). The Complaint alleged that Corning infringed two of PPC's patents - U.S. Patent Nos. 6,558,194 and 6,848,940 - each entitled "Connector and Method of Operation." In July 2015, a jury found that Corning willfully infringed both patents. Following a series of appeals, we received a pre-tax amount of approximately $62.1 million from Corning on July 19, 2018. We recorded the $62.1 million of cash received as a pre-tax gain from patent litigation during 2018. Prior to 2018, we had not recognized any amounts in our consolidated financial statements related to this matter. On September 27, 2018, Corning filed a petition for certiorari review by the U.S. Supreme Court. On December 10, 2018, Corning's certiorari review by the Supreme Court was denied, thus exhausting their opportunities for further appellate relief.

SEC Investigation - As disclosed on our Current Report on Form 8-K filed with the SEC on December 3, 2018, we are fully cooperating with an SEC investigation related to the material weakness in internal controls over financial reporting as of December 31, 2017 disclosed in our 2017 Form 10-K. We continue to believe that the outcome of the investigation will not have a material adverse effect on the Company.

We are also a party to various legal proceedings and administrative actions that are incidental to our operations. In our opinion, the proceedings and actions in which we are involved should not, individually or in the aggregate, have a material adverse effect on our financial condition, operating results, or cash flows. However, since the trends and outcome of this litigation are inherently uncertain, we cannot give absolute assurance regarding the future resolution of such litigation, or that such litigation may not become material in the future.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common stock is traded on the New York Stock Exchange under the symbol “BDC.” As of February 15, 2019, there were 254 record holders of common stock of Belden Inc.

On May 25, 2017, our Board of Directors authorized a share repurchase program, which allowed us to purchase up to $200.0 million of our common stock through open market repurchases, negotiated transactions, or other means, in accordance with applicable securities laws and other restrictions. This program was funded with cash on hand and cash flows from operating activities. Set forth below is information regarding our stock repurchases for the three months ended December 31, 2018.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Repurchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
October 1, 2018 through November 4, 2018	—	$ —	—	$ 50,000,000
November 5, 2018 through December 2, 2018	912,530	54.79	912,530	300,000,000
December 3, 2018 through December 31, 2018	—	—	—	300,000,000
Total	912,530	$ 54.79	912,530	$ 300,000,000

During the fourth quarter of 2018, we repurchased 0.9 million shares of our common stock under the program for an aggregate cost of $50.0 million and an average price per share of $54.79. During the year ended December 31, 2018, we repurchased a total of 2.7 million shares of our common stock under the program for an aggregate cost of $175.0 million and an average price per share of $64.94. From inception of the program to December 31, 2018, we have repurchased 3.0 million shares of our common stock under the program for an aggregate cost of $200.0 million and an average price of $66.48.

We utilized all of the $200.0 million authorized under this share repurchase program. On November 29, 2018, our Board of Directors authorized a share repurchase program, which allows us to purchase up to $300.0 million of our common stock through open market repurchases, negotiated transactions, or other means, in accordance with applicable securities laws and other restrictions. During 2018, we did not repurchase any shares of our common stock under this program.

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Stock Performance Graph

The following graph compares the cumulative total shareholder return on Belden's common stock over the five-year period ended December 31, 2018, with the cumulative total return during such period of the Standard and Poor's 500 Stock Index and the Standard and Poor's 1500 Industrials Index. The comparison assumes $100 was invested on December 31, 2013, in Belden's common stock and in each of the foregoing indices and assumes reinvestment of dividends. The stock performance shown on the graph below represents historical stock performance and is not necessarily indicative of future stock price performance.

(1) The chart above and the accompanying data are "furnished," not "filed," with the SEC.

Total Return To Shareholders
(Includes reinvestment of dividends)

	ANNUAL RETURN PERCENTAGE Years Ending December 31,				
Company Name / Index	2014	2015	2016	2017	2018
Belden Inc.	12.2 %	(39.3)%	57.3 %	3.5 %	(45.7)%
S&P 500 Index	13.7 %	1.4 %	12.0 %	21.8 %	(4.4)%
S&P 1500 Industrials Index	8.5 %	(2.7)%	20.4 %	21.1 %	(13.4)%

		INDEXED RETURNS Years Ending December 31,				
Company Name / Index	Base Period 2013	2014	2015	2016	2017	2018
Belden Inc.	$ 100.00	$112.18	$68.09	$107.10	$110.83	$60.21
S&P 500 Index	100.00	113.69	115.26	129.05	157.22	150.33
S&P 1500 Industrials Index	100.00	108.48	105.53	127.07	153.83	133.25

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Item 6. Selected Financial Data

	Years Ended December 31,				
	2018	2017	2016	2015	2014
	(In thousands, except per share amounts and percentages)				
Balance sheet data:					
Total assets	$3,779,321	$3,840,613	$3,806,803	$3,290,602	$3,232,202
Long-term debt	1,463,200	1,560,748	1,620,161	1,725,282	1,736,954
Long-term debt, including current maturities	1,463,200	1,560,748	1,620,161	1,727,782	1,739,454
Total stockholders' equity	1,387,588	1,434,866	1,461,317	825,523	807,186
Statement of operations data:					
Revenues	2,585,368	2,388,643	2,356,672	2,309,222	2,308,265
Operating income	305,221	235,404	232,083	143,731	166,017
Operating income margin	11.8 %	9.9 %	9.8 %	6.2 %	7.2 %
Income from continuing operations	160,711	92,853	127,646	66,508	74,432
Basic income per share attributable to Belden common stockholders	3.10	1.38	2.67	1.57	1.72
Diluted income per share attributable to Belden common stockholders	3.08	1.37	2.65	1.55	1.69
Other data:					
Basic weighted average common shares outstanding	40,675	42,220	42,093	42,390	43,273
Diluted weighted average common shares outstanding	40,956	42,643	42,557	42,953	43,997
Dividends per common share	$0.20	$0.20	$0.20	$0.20	$0.20
Statement of cash flow data:					
Net cash provided by operating activities	289,220	255,300	314,794	241,460	200,887
Adjusted results:					
Adjusted revenues	2,591,980	2,388,643	2,357,805	2,360,583	2,320,219
Adjusted EBITDA	474,162	434,276	431,201	400,688	359,425
Adjusted EBITDA margin	18.3 %	18.2 %	18.3 %	17.0 %	15.5 %
Free cash flow	192,953	192,078	261,212	187,024	157,312

Consolidated Results

Since 2014, we have grown our revenues by 12.0%, from $2.3 billion in 2014 to $2.6 billion in 2018, representing a 2.3% compounded annual growth rate for that period. The majority of our revenue growth has been the result of our inorganic initiatives, described below, as we have been operating in a period of modest end market growth rates.

The trends in our operating income and income from continuing operations from 2014-2018 have been impacted by a number of acquisitions, dispositions, productivity improvement programs, and other matters, as follows:

- During 2018, we acquired SAM and NT2 in our fiscal first and second quarters, respectively; and recognized severance, restructuring, and acquisition integration costs of $68.6 million primarily related to the integration of SAM with our Grass Valley business as well as costs from a program to consolidate our manufacturing footprint. We also recognized a $23.0 million loss on debt extinguishment related to our debt refinancing transactions during the year and a $62.1 million gain for amounts received from a patent infringement litigation - see further discussion in Part I Item 3 Legal Proceedings.
- During 2017, we recognized a $52.4 million loss on debt extinguishment related to our debt refinancing transactions during the year; severance, restructuring, and acquisition integration costs of $42.8 million related to a number of productivity improvement programs; and acquired Thinklogical Holdings, LLC in our fiscal second quarter.

- During 2016, we recognized severance, restructuring, and acquisition integration costs of $38.8 million related to a number of productivity improvement programs. In addition, we acquired M2FX Limited in our fiscal first quarter.
- During 2015, we recognized severance, restructuring, and acquisition integration costs of $47.2 million related to a number of productivity improvement programs. In addition, we acquired Tripwire in our fiscal first quarter. We also recognized $9.2 million of compensation expense related to the accelerated vesting of acquiree stock based compensation awards related to our acquisition of Tripwire.
- During 2014, we recognized severance, restructuring, and acquisition integration costs of $70.8 million related to the integration of acquired businesses and a productivity improvement program. In 2014, we acquired Grass Valley, ProSoft, and Coast. We recognized purchase accounting effects related to acquisitions, including the adjustment of acquired inventory to fair value, of $8.4 million.

See further discussion of our acquisitions and productivity improvement programs in Notes 4 and 12 to the Consolidated Financial Statements.

Since 2014, we have grown our operating cash flow by 44.0%, from $200.9 million in 2014 to $289.2 million in 2018, representing a 7.6% compounded annual growth rate for that period. Our strong operating cash flow is driven by our earnings growth, coupled with our efficient use of working capital.

Adjusted Results

Since 2014, we have grown our Adjusted Revenues by 11.7%, from $2.3 billion in 2014 to $2.6 billion in 2018, representing a 2.2% compounded annual growth rate for that period. The majority of our Adjusted Revenue growth has been the result of our inorganic initiatives, described above, as we have been operating in a period of modest end market growth rates.

We have grown our Adjusted EBITDA by 31.9%, from $359.4 million in 2014 to $474.2 million in 2018, representing a 5.7% compounded annual growth rate for that period. Adjusted EBITDA has grown due to the results of our inorganic initiatives, described above, which have transformed our product portfolio. Importantly, however, our Adjusted EBITDA has also grown due to the impact of productivity improvement programs, as we are committed to continuously improving our cost structure in a low organic growth environment. Furthermore, our Adjusted EBITDA has improved as Lean enterprise techniques have been applied at our acquired companies. These factors have all led to the improvement in Adjusted EBITDA margins from 15.5% in 2014 to 18.3% in 2018.

Since 2014, our free cash flow has increased by 22.7% from $157.3 million in 2014 to $193.0 million in 2018, representing a 4.2% compounded annual growth rate for that period. Our strong free cash flow is driven by our earnings growth, coupled with our efficient use of working capital and fixed assets.

Use of Non-GAAP Financial Information

Adjusted Revenues, Adjusted EBITDA, Adjusted EBITDA margin, and free cash flow are non-GAAP financial measures. In addition to reporting financial results in accordance with accounting principles generally accepted in the United States, we provide non-GAAP operating results adjusted for certain items, including: asset impairments; accelerated depreciation expense due to plant consolidation activities; purchase accounting effects related to acquisitions, such as the adjustment of acquired inventory and deferred revenue to fair value, and transaction costs; severance, restructuring, and acquisition integration costs; gains (losses) recognized on the disposal of businesses and tangible assets; amortization of intangible assets; gains (losses) on debt extinguishment; certain revenues and gains (losses) from patent settlements; discontinued operations; and other costs. We adjust for the items listed above in all periods presented, unless the impact is clearly immaterial to our financial statements. When we calculate the tax effect of the adjustments, we include all current and deferred income tax expense commensurate with the adjusted measure of pre-tax profitability.

We utilize the adjusted results to review our ongoing operations without the effect of these adjustments and for comparison to budgeted operating results. We believe the adjusted results are useful to investors because they help them compare our results to previous periods and provide important insights into underlying trends in the business and how management oversees our business operations on a day-to-day basis. As an example, we adjust for the purchase accounting effect of recording deferred revenue at fair value in order to reflect the revenues that would have otherwise been recorded by acquired businesses had they remained as independent entities. We believe this presentation is useful in evaluating the underlying performance of acquired companies. Similarly, we adjust for other acquisition-related expenses, such as amortization of intangibles and other impacts of fair value adjustments because they generally are not related to the acquired businesses' core business performance. As an additional example,

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we exclude the costs of restructuring programs, which can occur from time to time for our current businesses and/or recently acquired businesses. We exclude the costs in calculating adjusted results to allow us and investors to evaluate the performance of the business based upon its expected ongoing operating structure. We believe the adjusted measures, accompanied by the disclosure of the costs of these programs, provides valuable insight.

We define free cash flow, which is a non-GAAP financial measure, as net cash from operating activities adjusted for capital expenditures net of the proceeds from the disposal of tangible assets. We believe free cash flow provides useful information to investors regarding our ability to generate cash from business operations that is available for acquisitions and other investments, service of debt principal, dividends and share repurchases. We use free cash flow, as defined, as one financial measure to monitor and evaluate performance and liquidity. Non-GAAP financial measures should be considered only in conjunction with financial measures reported according to accounting principles generally accepted in the United States. Our definition of free cash flow may differ from definitions used by other companies.

Adjusted results should be considered only in conjunction with results reported according to accounting principles generally accepted in the United States. The following tables reconcile our GAAP results to our non-GAAP financial measures:

	December 31, 2018	December 31, 2017	Years Ended December 31, 2016	December 31, 2015	December 31, 2014
	(In thousands, except percentages)				
GAAP revenues	$2,585,368	$2,388,643	$ 2,356,672	$ 2,309,222	$ 2,308,265
Deferred revenue adjustments (1)	6,612	—	6,687	51,361	11,954
Patent settlement (2)	—	—	(5,554)	—	—
Adjusted revenues	$2,591,980	$2,388,643	$ 2,357,805	$ 2,360,583	$ 2,320,219
GAAP net income	160,711	92,853	127,646	66,180	$ 74,449
Amortization of intangible assets	98,829	103,997	98,385	103,791	58,426
Severance, restructuring, and acquisition integration costs (3)	68,613	42,790	31,140	47,170	70,827
Interest expense, net	61,559	82,901	95,050	100,613	81,573
Income tax expense (benefit)	59,619	6,495	(1,185)	(26,568)	7,114
Depreciation expense	47,615	45,597	47,208	46,551	43,736
Loss on debt extinguishment	22,990	52,441	2,342	—	—
Deferred revenue adjustments (1)	6,612	—	6,687	52,876	10,777
Purchase accounting effects related to acquisitions (4)	3,497	6,133	(2,079)	9,747	12,540
Costs related to patent litigation	2,634	—	—	—	—
Amortization of software development intangible assets	2,188	56	—	—	—
Non-operating pension settlement loss	1,342	—	7,630	—	—
Loss on sale of assets (5)	94	1,013	—	—	—
Impairment of assets held for sale (5)	—	—	23,931	—	—
Patent settlement (2)	—	—	(5,554)	—	—
Gain from patent litigation	(62,141)	—	—	—	—
Loss (Income) from discontinued operations	—	—	—	242	(579)

Loss from disposal of discontinued operations	—	—	—	86	562
Adjusted EBITDA	$474,162	$434,276	$ 431,201	$ 400,688	$ 359,425
GAAP net income margin	6.2 %	3.9 %	5.4 %	2.9 %	3.2 %
Adjusted EBITDA margin	18.3 %	18.2 %	18.3 %	17.0 %	15.5 %

(1) Our adjusted results include revenues that would have been recorded by acquired businesses had they remained as independent entities. Our consolidated results do not include these revenues due to the purchase accounting effect of recording deferred revenue at fair value.

(2) Both our consolidated revenues and gross profit were positively impacted by royalty revenues received during 2016 that related to years prior to 2016 as a result of a patent settlement.

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(3) See Note 12 to the Consolidated Financial Statements, Severance, Restructuring, and Acquisition Integration Activities, for details.

(4) In 2018, we recognized $3.5 million of cost of sales related to purchase accounting adjustments, most of which was for the adjustment of acquired inventory to fair value for our SAM and NT2 acquisitions. In 2017, we recognized $6.1 million of cost of sales related to the adjustment of acquired inventory to fair value for our Thinklogical acquisition. In 2016, we made a $3.2 million adjustment to reduce the earn-out liability associated with the M2FX acquisition. This adjustment was partially offset by $0.8 million and $0.2 million of cost of sales related to the adjustment of acquired inventory to fair value related our Enterprise segment and M2FX acquisition, respectively. In 2015, we recognized $9.2 million of compensation expense related to the accelerated vesting of acquiree stock based compensation awards associated with our acquisition of Tripwire. In addition, we recognized $0.3 million of cost of sales related to the adjustment of acquired inventory to fair value related to our acquisition of Coast and $0.3 million of acquisition related transaction costs. In 2014, we recognized $8.4 million of cost of sales related to the adjustment of acquired inventory to fair value for our acquisitions of Grass Valley, ProSoft, and Coast, as well as $4.1 million of acquisition related transaction costs.

(5) In 2018, 2017, and 2016, we recognized a $0.1 million loss on sale of assets, $1.0 million loss on sale of assets, and $23.9 million impairment of assets held for sale, respectively, for the sale of our MCS business and Hirschmann JV.

The following table reconciles our GAAP results to our non-GAAP financial measures:

	Years ended December 31,				
	2018	2017	2016	2015	2014
		(In thousands)			
Net cash provided by operating activities	$289,220	$255,300	$314,794	$241,460	$200,887
Capital expenditures, net of proceeds from the disposal of tangible assets	(96,267)	(63,222)	(53,582)	(54,436)	(43,575)
Free cash flow	$192,953	$192,078	$261,212	$187,024	$157,312

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

Overview

We are a signal transmission solutions company built around two global business platforms – Enterprise Solutions and Industrial Solutions. Our comprehensive portfolio of signal transmission solutions provides industry leading secure and reliable transmission of data, sound, and video for mission critical applications.

We strive to create shareholder value by:

- Delivering highly engineered signal transmission solutions for mission-critical applications in a diverse set of global markets;
- Maintaining a balanced product portfolio across end markets, applications, and geographies that allows for a disciplined approach to growth;
- Capturing additional market share by using our Market Delivery System to improve channel and end-user relationships and to concentrate sales efforts on customers in higher growth geographies and vertical end-markets;
- Managing our product portfolio to provide innovative and complete end-to-end solutions for our customers in applications for which we have operational expertise and can drive customer loyalty;
- Acquiring leading companies with innovative product portfolios and opportunities for synergies which fit within our strategic framework;
- Continuously improving our people, processes, and systems through scalable, flexible, and sustainable business systems for talent management, Lean enterprise, and acquisition cultivation and integration; and
- Protecting and enhancing the value of the Belden brands.

We believe our business system, balance across markets and geographies, systematic go-to-market approach, extensive portfolio of innovative solutions, commitment to Lean principles, and improving margin profile present a unique value proposition for our shareholders.

We consider Adjusted revenue growth on a constant currency basis, Adjusted EBITDA margin, free cash flows, and return on invested capital to be our key operating performance indicators. Our current business goals are to:

- Grow Adjusted Revenues on a constant currency basis by 5-7% per year, from a combination of end market growth, market share capture, and contributions from acquisitions;
- Achieve Adjusted EBITDA margins in the range of 20-22%;
- Achieve free cash flow growth in the range of 13-15%; and
- Realize return on invested capital of 13-15%.

Significant Trends and Events in 2018

The following trends and events during 2018 had varying effects on our financial condition, results of operations, and cash flows.

Foreign currency

Our exposure to currency rate fluctuations primarily relates to exchange rate movements between the U.S. dollar and the euro, Canadian dollar, Hong Kong dollar, Chinese yuan, Japanese yen, Mexican peso, Australian dollar, British pound, Indian rupee, and Brazilian real. Generally, as the U.S. dollar strengthens against these foreign currencies, our revenues and earnings are negatively impacted as our foreign denominated revenues and earnings are translated into U.S. dollars at a lower rate. Conversely, as the U.S. dollar weakens against foreign currencies, our revenues and earnings are positively impacted.

In addition to the translation impact described above, currency rate fluctuations have an economic impact on our financial results. As the U.S. dollar strengthens or weakens against foreign currencies, it results in a relative price increase or decrease for certain of our products that are priced in U.S. dollars in a foreign location.

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Commodity Prices

Our operating results can be affected by changes in prices of commodities, primarily copper and compounds, which are components in some of the products we sell. Generally, as the costs of inventory purchases increase due to higher commodity prices, we raise selling prices to customers to cover the increase in costs, resulting in higher sales revenue but a lower gross profit percentage. Conversely, a decrease in commodity prices would result in lower sales revenue but a higher gross profit percentage. Selling prices of our products are affected by many factors, including end market demand, capacity utilization, overall economic conditions, and commodity prices. Importantly, however, there is no exact measure of the effect of changing commodity prices, as there are thousands of transactions in any given quarter, each of which has various factors involved in the individual pricing decisions. Therefore, all references to the effect of copper prices or other commodity prices are estimates.

Channel Inventory

Our operating results also can be affected by the levels of Belden products purchased and held as inventory by our channel partners and customers. Our channel partners and customers purchase and hold our products in their inventory in order to meet the service and on-time delivery requirements of their customers. Generally, as our channel partners and customers change the level of Belden products owned and held in their inventory, it impacts our revenues. Comparisons of our results between periods can be impacted by changes in the levels of channel inventory. We are dependent upon our channel partners to provide us with information regarding the amount of our products that they own and hold in their inventory. As such, all references to the effect of channel inventory changes are estimates.

Market Growth and Market Share

The markets in which we operate can generally be characterized as highly competitive and highly fragmented, with many players. Based on available data for our served markets, we estimate that our market share across our segments is significant, ranging from approximately 5% - 20%. A substantial acquisition in one of our served markets would be necessary to meaningfully change our estimated market share percentage. We monitor available data regarding market growth, including independent market research reports, publicly available indices, and the financial results of our direct and indirect peer companies, in order to estimate the extent to which our served markets grew or contracted during a particular period. We generally expect that our unit sales volume will increase or decrease consistently with the market growth rate. Our strategic goal is to utilize our Market Delivery System to target faster growing geographies, applications, and trends within our end markets, in order to achieve growth that is higher than the general market growth rate. To the extent that we exceed the market growth rates, we consider it to be the result of capturing market share.

Operating Segments

Effective January 1, 2018, we changed our organizational structure and, as a result, now are reporting two segments. The segments formerly known as Broadcast Solutions and Enterprise Solutions now are presented as the Enterprise Solutions segment, and the segments formerly known as Industrial Solutions and Network Solutions now are presented as the Industrial Solutions segment. The reorganization allows us to further accelerate progress in key strategic areas and the segment consolidation properly aligns our external reporting with the way the businesses are now managed. We have recast the prior period segment information to conform to the change in the composition of these reportable segments. See Note 5.

Acquisitions

We completed the acquisitions of SAM and NT2 on February 8, 2018 and April 25, 2018, respectively. The results of both SAM and NT2 have been included in our Consolidated Financial Statements from their respective acquisition dates and are reported within the Enterprise Solutions segment. See Note 4.

Long-Term Debt

In March 2018, we issued €350.0 million ($431.3 million at issuance) aggregate principal amount of new senior subordinated notes due 2028 at an interest rate of 3.875%. During March and April 2018, we used the net proceeds of this offering to repurchase our outstanding $200.0 million 5.25% senior subordinated notes due 2024 and our outstanding €200.0 million 5.5% senior subordinated notes due 2023. We paid approximately $7.5 million of fees related to issuing the 2028 notes, and recognized a $23.0 million loss on debt extinguishment in 2018 for premiums paid to the bond holders to retire the 2024 and 2023 notes and for the unamortized debt issuance costs that we wrote-off. See Note 13.

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Gain from Patent Litigation

On July 5, 2011, the Company's wholly-owned subsidiary, PPC Broadband, Inc. ("PPC"), filed an action for patent infringement against Corning Optical Communications RF LLC ("Corning") alleging that Corning infringed two of PPC's patents. In July 2015, a jury found that Corning willfully infringed both patents. Following a series of appeals, we received a pre-tax amount of approximately $62.1 million from Corning on July 19, 2018. We recorded the $62.1 million of cash received as a pre-tax gain from patent litigation during 2018. Prior to 2018, we had not recognized any amounts in our consolidated financial statements related to this matter. On September 27, 2018, Corning filed a petition for certiorari review by the U.S. Supreme Court. On December 10, 2018, Corning's certiorari review by the Supreme Court was denied, thus exhausting their opportunities for further appellate relief.

Grass Valley and SAM Integration Program: 2018

During the first quarter of 2018, we began a restructuring program to integrate SAM with Grass Valley. The restructuring and integration activities are focused on achieving desired cost savings by consolidating existing and acquired facilities and other support functions. We recognized $42.3 million of severance and other restructuring costs for this program during 2018. The costs were incurred by the Enterprise Solutions segment. We expect to incur approximately $3 million of additional severance and restructuring costs for this program, which will be incurred during the first quarter of 2019. See Note 12.

Industrial Manufacturing Footprint Program: 2016-2018

In 2016, we began a program to consolidate our manufacturing footprint. The manufacturing consolidation is substantially complete. We recognized $17.7 million of severance and other restructuring costs for this program during 2018. The costs were incurred by the Enterprise Solutions and Industrial Solutions segments, as the manufacturing locations involved in the program serve both platforms. To date, we have incurred a total of $66.1 million in severance and other restructuring costs, including manufacturing inefficiencies for this program. See Note 12.

Disposals

During 2018, we sold a previously closed operating facility for net proceeds of $1.5 million and recognized a $0.6 million gain on the sale.

During 2018, we collected proceeds of $40.2 million from the sale of our MCS business and 50% ownership interest in Xuzhou Hirschmann Electronics Co. Ltd (the Hirschmann JV), which we committed to selling during the fourth quarter of 2016. The MCS business was part of the Industrial Solutions segment and the Hirschmann JV was an equity method investment that was not included in an operating segment. The MCS business operated in Germany and the United States, and the Hirschmann JV was an equity method investment located in China. We reached an agreement in principle to sell this disposal group in 2016, however, the sale was executed in 2017 and the funds were received in 2018. See Note 2.

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Results of Operations
Consolidated Income before Taxes

	2018	2017	2016	Percentage Change 2018 vs. 2017	Percentage Change 2017 vs. 2016
	(In thousands, except percentages)				
Revenues	$2,585,368	$2,388,643	$2,356,672	8.2 %	1.4 %
Gross profit	1,008,412	934,753	981,321	7.9 %	(4.7)%
Selling, general and administrative expenses	525,918	461,022	486,403	14.1 %	(5.2)%
Research and development expenses	140,585	134,330	140,519	4.7 %	(4.4)%
Amortization of intangibles	98,829	103,997	98,385	(5.0)%	5.7 %
Gain from patent litigation	62,141	—	—	n/a	— %
Impairment of assets held for sale	—	—	23,931	— %	(100.0)%
Operating income	305,221	235,404	232,083	29.7 %	1.4 %
Interest expense, net	61,559	82,901	95,050	(25.7)%	(12.8)%
Non-operating pension cost	342	714	8,230	(52.1)%	(91.3)%
Loss on debt extinguishment	22,990	52,441	2,342	(56.2)%	2,139.2 %
Income before taxes	220,330	99,348	126,461	121.8 %	(21.4)%

2018 Compared to 2017

Revenues increased $196.8 million from 2017 to 2018 due to the following factors:

- Acquisitions contributed $123.9 million to the increase in revenues.
- Higher sales volume resulted in a $75.7 million increase in revenues.
- Currency translation had a $14.8 million favorable impact on revenues.
- Higher copper costs contributed $10.1 million to the increase in revenues.
- The divestiture of our MCS business resulted in a $27.7 million decrease in revenues.

Gross profit increased $73.7 million from 2017 to 2018 while gross profit margin remained relatively flat year-over-year. The increase in gross profit is primarily attributable to the increase in revenues discussed above, and the impact on margins is due to copper prices, which result in higher revenues as discussed above, but as they have minimal impact to gross profit dollars, result in lower gross profit margins. Gross profit for 2018 included $28.1 million of severance, restructuring, and acquisition integration costs; $2.2 million for the amortization of software development intangible assets; and $1.8 million of cost of sales arising from the adjustment of inventory to fair value related to acquisitions. Gross profit for 2017 included $32.6 million of severance, restructuring, and acquisition integration costs; $6.1 million of cost of sales arising from the adjustment of inventory to fair value related to an acquisition; and $0.8 million of accelerated depreciation in our Enterprise Solutions segment.

Selling, general and administrative expenses increased $64.9 million from 2017 to 2018 primarily due to increases in acquisitions; severance, restructuring, and acquisition integration costs; currency translation; costs related to patent litigation; and purchase accounting effects of acquisitions, which contributed an estimated $35.5 million, $25.1 million, $3.7 million, $2.6 million, and $1.7 million, respectively, to the increase in selling, general and administrative expenses; partially offset by the MCS divestiture in 2017, which contributed to a decline of approximately $3.7 million over the year ago period.

Research and development expenses increased $6.3 million from 2017 to 2018 primarily due to acquisitions; increases from severance, restructuring, and acquisition integration costs; and currency translation, which contributed an estimated $12.0 million, $5.2 million, and $1.3 million, respectively, to the increase in research and development expenses year-over-year. These increases were partially offset by $10.0 million and $2.2 million from improved productivity and the MCS divestiture in the fourth quarter of 2017, respectively.

Amortization of intangibles decreased $5.2 million from 2017 to 2018 primarily due to certain intangible assets becoming fully amortized, partially offset by an increase in amortization expense for intangible assets from the acquisitions of SAM and NT2. See Note 10.

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The $62.1 million gain from patent litigation in 2018 is for judgments received in 2018 from the patent infringement case filed in 2011 by our wholly-owned subsidiary, PPC, against Corning alleging they willfully infringed upon two patents. After years of post-trial motions and appeals, the District Court ruled in favor of PPC and required Corning to pay judgments of $62.1 million in 2018 to PPC. See Note 2.

Operating income increased $69.8 million from 2017 to 2018 primarily due to the gain from patent litigation and increases in gross profit discussed above, partially offset by the changes in operating expenses discussed above.

Net interest expense decreased $21.3 million from 2017 to 2018 as a result of our debt transactions during 2017 and 2018. In July 2017, we issued €450.0 million aggregate principal amount of new senior subordinated notes due 2027 at an interest rate of 3.375%, and used the net proceeds of this offering and cash on hand to repurchase all of our outstanding $700.0 million 5.5% senior subordinated notes due 2022. In September 2017, we issued €300.0 million aggregate principal amount of new senior subordinated notes due 2025 at an interest rate of 2.875%, and used the net proceeds of this offering to repurchase €300.0 million of our outstanding €500.0 million 5.5% senior subordinated notes due 2023. In March 2018, we issued €350.0 million aggregate principal amount of new senior subordinated notes due 2028 at an interest rate of 3.875%, and used the net proceeds of this offering and cash on hand to repurchase all of our outstanding €200.0 million 5.5% senior subordinated notes due 2023 as well as all of our outstanding $200.0 million 5.25% senior subordinated notes due 2024.

The loss on debt extinguishment recognized in 2018 represents the premium paid to the bond holders to retire the 2023 and 2024 notes as well as the unamortized debt issuance costs that were written-off. The loss on debt extinguishment recognized in 2017 represents the premium paid to the bond holders to retire the 2022 and a portion of the 2023 notes as well as the unamortized debt issuance costs that were written-off and the unamortized debt issuance costs related to creditors no longer participating in the Amended and Restated Credit Agreement (the Revolver), which we amended in May 2017. See Note 13.

Income before taxes increased by $121.0 million from 2017 to 2018 primarily due to the increase in operating income, decrease in interest expense, and decrease in the loss on debt extinguishment discussed above.

2017 Compared to 2016

Revenues increased $31.9 million from 2016 to 2017 due to the following factors:

- Acquisitions contributed $30.8 million to the increase in revenues.
- Higher copper costs contributed $13.0 million to the increase in revenues.
- Currency translation had a $12.2 million favorable impact on revenues.
- Lower sales volume resulted in a $24.1 million decrease in revenues.

Gross profit decreased $47.0 million from 2016 to 2017, and gross profit margin decreased 250 basis points from 41.6% in 2016 to 39.1% in 2017. The decrease in gross profit and margin is primarily attributable to the decrease in lower sales volume discussed above; increases in severance, restructuring, and acquisition integration costs; and increases in copper costs. Increases in copper prices result in higher revenues as discussed above, but as they have minimal impact to gross profit dollars, resulting in lower gross profit margins. Gross profit for 2017 included $32.6 million of severance, restructuring, and acquisition integration costs; $6.1 million of cost of sales arising from the adjustment of inventory to fair value related to an acquisition; and $0.8 million of accelerated depreciation in our Enterprise Solutions segment. Gross profit for 2016 included $12.3 million of severance, restructuring, and acquisition integration costs; $1.0 million of cost of sales arising from the adjustment of inventory to fair value related to acquisitions; and $0.9 million of accelerated depreciation in our Enterprise Solutions segment.

Selling, general and administrative expenses decreased by $33.2 million from 2016 to 2017 primarily due to a $15.7 million decrease in severance, restructuring, and acquisition integration costs and improved productivity. Selling, general and administrative expenses included $10.0 million of severance, restructuring, and integration costs in 2017 as compared to $25.7 million in 2016. The remaining decrease is primarily due to realized benefits from our productivity improvement initiatives.

Research and development expenses decreased by $6.3 million from 2016 to 2017 primarily due to productivity improvement initiatives, which contributed $8.8 million to the decline in research and development expenses, partially offset by $2.7 million from the acquisition of Thinklogical.

Amortization of intangibles increased $5.6 million from 2016 to 2017 primarily due to the acquisition of Thinklogical and amortization from the Tripwire trademark, which we began amortizing in 2017. These increases were partially offset by the intangible assets classified as held for sale for which we ceased amortizing in the fourth quarter of 2016. See Note 10.

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The $23.9 million impairment of assets held for sale in 2016 related to our MCS business and Hirschmann JV. The amount of the impairment of assets held for sale represents the excess carrying value over the fair value of the assets. See Note 2.

Operating income increased by $10.8 million from 2016 to 2017 primarily due to the impairment of assets held for sale in the prior year and the decline in selling, general and administrative expenses; partially offset by the decline in gross profit discussed above.

Interest expense decreased $12.2 million from 2016 to 2017 due to the financing activities in 2017 discussed above. See Note 13.

The loss on debt extinguishment increased $50.1 million from 2016 to 2017. The loss on debt extinguishment recognized in 2017 is the result of the refinancing actions discussed above. The loss on debt extinguishment recognized in 2016 represents the unamortized debt issuance costs written off for the Term Loan that we repaid in 2016. See Note 13.

Income before taxes decreased by $27.2 million from 2016 to 2017 primarily due to the increase in loss on debt extinguishment discussed above.

Income Taxes

	2018	2017	2016	Percentage Change 2018 vs. 2017	Percentage Change 2017 vs. 2016
	(In thousands, except percentages)				
Income before taxes	$220,330	$99,348	$126,461	121.8 %	(21.4)%
Income tax benefit (expense)	(59,619)	(6,495)	1,185	817.9 %	(648.1)%
Effective tax rate	27.1 %	6.5 %	(0.9)%		

2018 Compared to 2017

We recognized income tax expense of $59.6 million in 2018, representing an effective tax rate of 27.1%. The effective tax rate was impacted by the "Tax Cuts and Jobs Act" (the “Act”) and foreign tax rate differences.

On December 22, 2017, the Act was signed into law, making significant changes to the U.S. Internal Revenue Code. Changes include, but are not limited to, a corporate tax rate decrease from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial tax system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. In accordance with the Act, we recorded $28.4 million as additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. The total income tax expense included a $36.0 million tax benefit for the remeasurement of deferred tax assets and liabilities to the 21% rate at which they are expected to reverse, offset with a one-time tax expense on deemed repatriation of $29.1 million and a valuation allowance of $35.3 million recorded against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law. Additionally, Staff Accounting Bulletin No. 118 (“SAB 118”) was issued to address the application of U.S. GAAP 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 Act. December 22, 2018 marked the end of the measurement period for purposes of SAB 118. As such, we have completed our analysis based on legislative updates relating to the Act currently available, which resulted in additional SAB 118 tax expense of $10.0 million for the year ended December 31, 2018. The total tax expense included an $8.0 million tax expense associated with an increase to the valuation allowance against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law, a $1.3 million tax expense adjustment to the transition tax on the deemed repatriation of cumulative foreign earnings, a $1.1 million tax expense resulting from a valuation allowance established on the deferred tax assets associated with stock options of covered employees, and a $0.4 million income tax benefit associated with an adjustment to the remeasurement of certain deferred tax assets and liabilities.

Our income tax expense was also impacted by foreign tax rate differences. Foreign tax rate differences reduced our income tax expense by approximately $4.0 million and $13.0 million in 2018 and 2017, respectively.

Our income tax expense and effective tax rate in future periods may be impacted by many factors, including our geographic mix of income and changes in tax laws.

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As of December 31, 2018, we maintained a valuation allowance on our deferred tax assets of $90.9 million. Of this amount, approximately $58.0 million relates to net operating loss deferred tax assets for certain of our Grass Valley entities. Certain Grass Valley entities have a history of significant tax losses in their various jurisdictions. We do not currently have sufficient history of taxable income in the relevant jurisdictions to support the realizability of the net operating losses.

The remaining $32.8 million of valuation allowance primarily relates to deferred tax assets for certain U.S foreign tax credits and U.S. state net operating losses and tax credits. The $23.9 million valuation allowance on the foreign tax credits is a direct result of the Act, as described above. The remaining $8.9 million valuation allowance primarily relates to state net operating losses and tax credits. While we have positive evidence in the form of projected sources of income, we determined that these state carryforward assets were not realizable as of December 31, 2018 due to a history of net operating losses and tax credits expiring without being utilized in certain states and because the current forecast of income is not sufficient to utilize all of these state net operating losses and tax credits prior to expiration.

2017 Compared to 2016

We recognized income tax expense of $6.5 million in 2017, representing an effective tax rate of 6.5%. The effective tax rate was impacted by the following significant factors:

- On December 22, 2017, the “Tax Cuts and Jobs Act” (the “Act”) was signed into law, making significant changes to the U.S. Internal Revenue Code. Changes included, but were not limited to, a corporate tax rate decrease from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial tax system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. The Company calculated its best estimate of the impact of the Act in its income tax provision for the year ended December 31, 2017 in accordance with its understanding of the Act and guidance available as of the date of the filing of the 2017 Form 10-K, and as a result, recorded $28.4 million of additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. This provisional income tax expense was comprised of a $36.0 million tax benefit for the remeasurement of deferred tax assets and liabilities to the 21% rate at which they were expected to reverse, offset by $29.1 million for a one-time tax expense on deemed repatriation, and a $35.3 million valuation allowance recorded against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law.
- We recognized a net tax benefit of $27.1 million resulting from a non-taxable translation gain associated with a debt instrument that was treated as a loan for U.S. GAAP purposes but as equity for tax purposes.

The net tax benefit described above for 2017 was partially offset by $2.2 million of tax expense to record a liability for uncertain tax positions primarily for our foreign jurisdictions.

Our income tax expense was also impacted by foreign tax rate differences. The statutory tax rates associated with our foreign earnings generally were lower than the 2017 statutory U.S. tax rate of 35%. This had the greatest impact on our income before taxes that was generated in Germany, Canada, and the Netherlands, which have statutory tax rates of approximately 28%, 26%, and 25%, respectively. Foreign tax rate differences reduced our income tax expense by approximately $13.0 million and $17.7 million in 2017 and 2016, respectively.

Our income tax expense and effective tax rate in future periods may be impacted by many factors, including our geographic mix of income and changes in tax laws.

As of December 31, 2017, we maintained a valuation allowance on our deferred tax assets of $151.8 million. Of this amount, approximately $104.3 million related to net operating loss deferred tax assets for certain of our Grass Valley entities. Certain Grass Valley entities have a history of significant tax losses in their various jurisdictions. We do not currently have sufficient history of taxable income in the relevant jurisdictions to support the realizability of the net operating losses.

The remaining $47.5 million of valuation allowance primarily related to deferred tax assets for certain U.S foreign tax credits and U.S. state net operating losses and tax credits. The $35.3 million valuation allowance on the foreign tax credits was a direct result of the Act, as described above. The remaining $12.2 million valuation allowance related to state net operating losses and tax credits. While we have positive evidence in the form of projected sources of income, we determined that these state carryforward assets were not realizable as of December 31, 2017 due to a history of net operating losses and tax credits expiring without being utilized in certain states and because the forecast of income at such time was not sufficient to utilize all of these state net operating losses and tax credits prior to expiration.

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Consolidated Adjusted Revenues and Adjusted EBITDA

	2018	2017	2016	Percentage Change 2018 vs. 2017	2017 vs. 2016
	(In thousands, except percentages)				
Adjusted Revenues	$2,591,980	$2,388,643	$2,357,805	8.5 %	1.3 %
Adjusted EBITDA	474,162	434,276	431,201	9.2 %	0.7 %
as a percent of adjusted revenues	18.3 %	18.2 %	18.3 %		

2018 Compared to 2017

Adjusted Revenues increased $203.4 million in 2018 from 2017 due to the following factors:

- Acquisitions contributed $130.5 million to the increase in adjusted revenues.
- Higher sales volume resulted in a $75.7 million increase in adjusted revenues.
- Currency translation had a $14.8 million favorable impact on adjusted revenues.
- Higher copper costs contributed $10.1 million to the increase in adjusted revenues.
- The divestiture of our MCS business resulted in a $27.7 million decrease in adjusted revenues.

Adjusted EBITDA increased $39.9 million in 2018 from 2017 primarily due to the increases in revenues discussed above as well as productivity initiatives.

2017 Compared to 2016

Adjusted Revenues increased $30.8 million in 2017 from 2016 due to the following factors:

- Acquisitions contributed $30.8 million to the increase in adjusted revenues.
- Higher copper costs contributed $13.0 million to the increase in adjusted revenues.
- Currency translation had a $12.2 million favorable impact on adjusted revenues.
- Lower sales volume resulted in a $25.2 million decrease in adjusted revenues.

Adjusted EBITDA increased $3.1 million in 2017 from 2016 primarily due to productivity initiatives and the impact of acquisitions and currency translation; partially offset by lower sales volume.

Use of Non-GAAP Financial Information

Adjusted Revenues, Adjusted EBITDA, Adjusted EBITDA margin, and free cash flow are non-GAAP financial measures. In addition to reporting financial results in accordance with accounting principles generally accepted in the United States, we provide non-GAAP operating results adjusted for certain items, including: asset impairments; accelerated depreciation expense due to plant consolidation activities; purchase accounting effects related to acquisitions, such as the adjustment of acquired inventory and deferred revenue to fair value, and transaction costs; severance, restructuring, and acquisition integration costs; gains (losses) recognized on the disposal of businesses and tangible assets; amortization of intangible assets; gains (losses) on debt extinguishment; certain revenues and gains (losses) from patent settlements; discontinued operations; and other costs. We adjust for the items listed above in all periods presented, unless the impact is clearly immaterial to our financial statements. When we calculate the tax effect of the adjustments, we include all current and deferred income tax expense commensurate with the adjusted measure of pre-tax profitability.

We utilize the adjusted results to review our ongoing operations without the effect of these adjustments and for comparison to budgeted operating results. We believe the adjusted results are useful to investors because they help them compare our results to previous periods and provide important insights into underlying trends in the business and how management oversees our business operations on a day-to-day basis. As an example, we adjust for the purchase accounting effect of recording deferred revenue at fair value in order to reflect the revenues that would have otherwise been recorded by acquired businesses had they remained as independent entities. We believe this presentation is useful in evaluating the underlying performance of acquired companies. Similarly, we adjust for other acquisition-related expenses, such as amortization of intangibles and other impacts of fair value adjustments because they generally are not related to the acquired businesses' core business performance. As an additional example, we exclude the costs of restructuring programs, which can occur from time to time for our current businesses and/or recently acquired businesses. We exclude the costs in calculating adjusted results to allow us and investors to evaluate the performance of

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the business based upon its expected ongoing operating structure. We believe the adjusted measures, accompanied by the disclosure of the costs of these programs, provides valuable insight.

Adjusted results should be considered only in conjunction with results reported according to accounting principles generally accepted in the United States. See Item 6, Selected Financial Data, for the tables that reconcile our GAAP results to our non-GAAP financial measures.

Segment Results of Operations

For additional information regarding our segment measures, see Note 5 to the Consolidated Financial Statements.

Enterprise Solutions

	2018	2017	2016	Percentage Change 2018 vs. 2017	Percentage Change 2017 vs. 2016
	(In thousands, except percentages)				
Segment Revenues	$1,522,178	$1,356,305	$1,372,941	12.2 %	(1.2)%
Segment EBITDA	267,656	216,558	239,978	23.6 %	(9.8)%
as a percent of segment revenues	17.6 %	16.0 %	17.5 %		

2018 Compared to 2017

Enterprise revenues increased $165.9 million in 2018 as compared to 2017 primarily due to acquisitions, increases in volume, favorable currency translation, and higher copper prices, which contributed $130.5 million, $25.2 million, $5.8 million, and $4.4 million, respectively, to the increase in revenues over the year ago period.

Enterprise EBITDA increased $51.1 million in 2018 as compared to 2017 primarily due to the increases in revenues discussed above and successful restructuring actions. Accordingly, EBITDA margins expanded 160 basis points over the year ago period.

2017 Compared to 2016

Enterprise revenues decreased $16.6 million in 2017 as compared to 2016 primarily due to decreases in volume, which contributed $66.6 million to the decrease in revenues. The decrease in volume was partially offset by $30.8 million of revenues from the acquisition of Thinklogical as well as higher copper costs and favorable currency translation, which had a $15.3 million and $3.9 million favorable impact on revenues, respectively.

Enterprise EBITDA decreased $23.4 million in 2017 as compared to 2016 primarily due to the decreases in revenues discussed above and the inability to fully and timely pass through the rising copper costs to our customers; partially offset by improved productivity resulting from our restructuring actions and acquisition integration activities.

Industrial Solutions

	2018	2017	2016	Percentage Change 2018 vs. 2017	Percentage Change 2017 vs. 2016
	(In thousands, except percentages)				
Segment Revenues	$1,069,802	$1,032,338	$984,864	3.6 %	4.8 %
Segment EBITDA	207,724	214,190	193,811	(3.0)%	10.5 %
as a percent of segment revenues	19.4 %	20.7 %	19.7 %		

2018 Compared to 2017

Industrial Solutions revenues increased $37.5 million in 2018 as compared to 2017 primarily due to volume growth, favorable currency translation, and higher copper costs, which contributed $50.5 million, $9.0 million, and $5.7 million, respectively, to the increase in revenues year over year; partially offset by $27.7 million from the MCS divestiture in 2017.

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Industrial EBITDA decreased $6.5 million in 2018 as compared to 2017. The revenue growth discussed above was offset by unfavorable product mix and temporary inefficiencies related to extended lead times throughout the supply chain experienced in 2018.

2017 Compared to 2016

Industrial Solutions revenues increased $47.5 million in 2017 as compared to 2016 primarily due to volume growth, higher copper costs, and favorable currency translation, which contributed $24.6 million, $14.5 million, and $8.4 million, respectively, to the increase in revenues year over year. Our robust growth in volume stems from our continued strength in discrete manufacturing, our largest vertical.

Industrial EBITDA increased $20.4 million in 2017 as compared to 2016 primarily due to leverage on volume and productivity improvements. Accordingly, Industrial Solutions EBITDA margins expanded 100 basis points to 20.7%.

Liquidity and Capital Resources

Significant factors affecting our cash liquidity include (1) cash provided by operating activities, (2) disposals of businesses and tangible assets, (3) cash used for acquisitions, restructuring actions, capital expenditures, share repurchases, dividends, and senior subordinated note repurchases, (4) our available credit facilities and other borrowing arrangements, and (5) cash proceeds from equity offerings. We expect our operating activities to generate cash in 2019 and believe our sources of liquidity are sufficient to fund current working capital requirements, capital expenditures, contributions to our retirement plans, share repurchases, senior subordinated note repurchases, quarterly dividend payments, and our short-term operating strategies. However, we may require external financing were we to complete a significant acquisition. Our ability to continue to fund our future needs from business operations could be affected by many factors, including, but not limited to: economic conditions worldwide, customer demand, competitive market forces, customer acceptance of our product mix, and commodities pricing.

The following table is derived from our Consolidated Cash Flow Statements:

	Years Ended December 31, 2018	2017
	(In thousands)	
Net cash provided by (used for):		
Operating activities	$ 289,220	$ 255,300
Investing activities	(140,676)	(230,118)
Financing activities	(281,770)	(331,448)
Effects of currency exchange rate changes on cash and cash equivalents	(7,272)	19,258
Decrease in cash and cash equivalents	(140,498)	(287,008)
Cash and cash equivalents, beginning of year	561,108	848,116
Cash and cash equivalents, end of year	$ 420,610	$ 561,108

Net cash provided by operating activities totaled $289.2 million for 2018 compared to $255.3 million for 2017. The increase over the year ago period is primarily due to the $62.1 million received from Corning for the patent infringement litigation, an increase in net income, and a favorable change in inventory; partially offset by an unfavorable change in accounts payable. Inventory was a use of cash of $14.8 million in 2018 compared to $84.1 million in the prior year. The increase in inventory levels in 2017 was greater than in 2018 due in part to the build in safety stock inventory throughout 2017 to support the closure of an operating facility. Accounts payable was a use of cash of $29.4 million in 2018 compared to a source of cash of $100.8 million in the prior year. The accounts payable use of cash in 2018 is primarily attributable to the growth in inventory levels in the latter part of 2017 as discussed above.

Net cash used for investing activities totaled $140.7 million for 2018 compared to $230.1 million for 2017. Investing activities for 2018 included capital expenditures of $97.8 million; payments, net of cash acquired, for acquisitions of $84.6 million; net proceeds from the sale of an operating facility of $1.5 million; and net of cash received for the sale of the MCS business and Hirschmann JV which closed on December 31, 2017 of $40.2 million. Investing activities for 2017 included payments, net of cash acquired, for acquisitions of $166.9 million and capital expenditures of $64.3 million.

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Net cash flows from financing activities was a $281.8 million use of cash for 2018 compared to $331.4 million for 2017. Financing activities for 2018 included payments under borrowing arrangements of $484.8 million, payments under our share repurchase program of $175.0 million, cash dividend payments of $43.2 million, debt issuance costs of $7.6 million, net payments related to share based compensation activities of $2.1 million, payments for the redemption of our stockholders' rights agreement of $0.4 million, and cash proceeds from the issuance of the €350.0 million 3.875% Notes due 2028 of $431.3 million. Financing activities for 2017 included payments under borrowing arrangements of $1,105.9 million, cash dividend payments of $43.4 million, debt issuance costs of $17.3 million, payments under our share repurchase program of $25.0 million, net payments related to share based compensation activities of $6.6 million, and borrowings under credit arrangements of $866.7 million.

Our cash and cash equivalents balance was $420.6 million as of December 31, 2018. Of this amount, $184.1 million was held outside of the U.S. in our foreign operations. Substantially all of the foreign cash and cash equivalents are readily convertible into U.S. dollars or other foreign currencies. The Tax Cuts and Jobs Act of 2017 included a one-time transition tax of unremitted foreign earnings. Accordingly, in the years ended December 31, 2018 and 2017, we recorded a tax expense of $1.3 million and $29.1 million, respectively, most of which was non-cash and related to the transition tax on the one-time mandatory deemed repatriation of all our foreign earnings. Our strategic plan does not require the repatriation of foreign cash in order to fund our operations in the U.S., and it is our current intention to permanently reinvest the foreign cash and cash equivalents outside of the U.S. If we were to repatriate the foreign cash to the U.S., we may be required to accrue and pay U.S. taxes in accordance with applicable U.S. tax rules and regulations as a result of the repatriation. See Note 15, Income Taxes in the accompanying notes to our consolidated financial statements.

Our outstanding debt obligations as of December 31, 2018 consisted of $1.5 billion of senior subordinated notes. As of December 31, 2018, we had no borrowings outstanding on the Revolver, and our available borrowing capacity was $359.1 million. Additional discussion regarding our various borrowing arrangements is included in Note 13 to the Consolidated Financial Statements.

Contractual obligations outstanding at December 31, 2018, have the following scheduled maturities:

	Total	Less than 1 Year	1-3 Years	4-5 Years	More than 5 Years
	(In thousands)				
Long-term debt payment obligations (1)(2)	1,485,900	$—	$—	$—	$1,485,900
Interest payments on long-term debt obligations	455,700	52,149	104,299	104,299	194,953
Operating lease obligations (3)	100,926	19,877	32,307	19,971	28,771
Purchase obligations (4)	30,248	30,248	—	—	—
Other commitments (5)	8,292	1,792	5,725	775	—
Pension and other postemployment obligations	83,014	7,729	15,818	17,287	42,180
Total	$2,164,080	$111,795	$158,149	$142,332	$1,751,804

(1) As described in Note 13 to the Consolidated Financial Statements.

(2) Amounts do not include accrued and unpaid interest. Accrued and unpaid interest related to long-term debt obligations is reflected on the line entitled, "Interest payments on long-term debt obligations" in the table.

(3) As described in Note 22 to the Consolidated Financial Statements.

(4) Includes agreements to purchase goods or services that are enforceable and legally binding on us and that specify all significant terms, including fixed or minimum quantities to be purchased; fixed, minimum, or variable price provisions; and the approximate timing of the transaction.

(5) Does not include accounts payable reflected in the financial statements. Includes obligations for uncertain tax positions and legal settlement obligations (see Notes 15 and 27 to the Consolidated Financial Statements).

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Our commercial commitments expire or mature as follows:

	Total	Less than 1 Year	1-3 Years	3-5 Years	More than 5 Years
	(In thousands)				
Standby financial letters of credit	$7,467	$7,184	$283	$ —	$ —
Bank guarantees	3,957	2,561	1,396	—	—
Surety bonds	2,360	2,360	—	—	—
Total	$13,784	$12,105	$1,679	$ —	$ —

Standby financial letters of credit, bank guarantees, and surety bonds are generally issued to secure obligations we have for a variety of commercial reasons such as workers compensation self-insurance programs in several states and the importation and exportation of product. We expect to replace most of these when they expire or mature.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, results of operations, or cash flows that are or would be considered material to investors.

Current-Year Adoption of Recent Accounting Pronouncements

Discussion regarding our adoption of accounting pronouncements is included in Note 2 to the Consolidated Financial Statements.

Critical Accounting Estimates

Our consolidated financial statements are prepared in conformity with accounting principles generally accepted in the U.S. (GAAP). In connection with the preparation of our financial statements, we are required to make assumptions and estimates about future events, and apply judgments that affect the reported amounts of assets, liabilities, revenues, expenses, and the related disclosures. We base our assumptions, estimates, and judgments on historical experience, current trends, and other factors that management believes to be relevant at the time our consolidated financial statements are prepared. On a regular basis, we review the accounting policies, assumptions, estimates, and judgments to ensure that our financial statements are presented fairly and in accordance with GAAP. However, because future events and their effects cannot be determined with certainty, actual results could differ from our assumptions and estimates, and such differences could be material.

Our significant accounting policies are discussed in Note 2 of our Consolidated Financial Statements. We believe that the following accounting estimates are the most critical to aid in fully understanding and evaluating our reported financial results, and they require our most difficult, subjective, or complex judgments, resulting from the need to make estimates about the effect of matters that are inherently uncertain.

Revenue Recognition

We recognize revenue consistent with the principles as outlined in the following five step model: (1) identify the contract with the customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when (or as) each performance obligation is satisfied. See Note 3.

At the time of sale, we establish an estimated reserve for trade, promotion, and other special price reductions such as contract pricing, discounts to meet competitor pricing, and on-time payment discounts. We also reserve for, among other things, correction of billing errors, incorrect shipments, and settlement of customer disputes. Customers are allowed to return inventory if and when certain conditions regarding the functionality of the inventory and our approval of the return are met. Certain distribution customers are allowed to return inventory at original cost, in an amount not to exceed three percent of the prior year's purchases, in exchange for an order of equal or greater value. Until we can process these reductions, corrections, and returns (together, the Changes) through individual customer records, we estimate the amount of outstanding Changes and recognize them by reducing revenues and accounts receivable. We determine our estimate based on our historical Changes as a percentage of revenues and the average time period between the original sale and the issuance of the Changes. We also adjust other current assets and cost of sales for the estimated level of returns.

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We base these estimates on historical and anticipated sales demand, trends in product pricing, and historical and anticipated Changes patterns. We make revisions to these estimates in the period in which the facts that give rise to each revision become known. Future market conditions and product transitions might require us to take actions to further reduce prices and increase customer return authorizations. We do not believe there is a reasonable likelihood that there will be a material change in the future estimates or assumptions we use to measure the Changes. However, if actual results are not consistent with our estimates or assumptions, we may be exposed to losses or gains that could be material. A 10% change in our sales reserve for such Changes as of December 31, 2018 would have affected net income by less than $1 million in 2018.

At times, we enter into arrangements that involve the delivery of multiple promised goods or services. For these arrangements, when the promised goods or services can be separated, the revenue is allocated to each distinct good or service based on that performance obligation's relative standalone selling price and recognized based on the period of delivery for each performance obligation Generally, we determine standalone selling price using the adjusted market assessment approach. For software licenses with highly variable standalone selling prices sold with either support or professional services, we generally determine the standalone selling price of the software license using the residual approach.

Revenue allocated to support services under our support contracts is typically recognized ratably over the term of the service. Revenue allocated to distinct professional services is recognized when (or as) the performance obligation is satisfied depending on the terms of the arrangement. When professional services are not distinct from goods, the professional services and goods are combined into one performance obligation, and revenue allocated to that performance obligation is recognized when (or as) the performance obligation is satisfied.

Income Taxes

We recognize deferred tax assets resulting from tax credit carryforwards, net operating loss carryforwards, and deductible temporary differences between taxable income on our income tax returns and income before taxes under GAAP. Deferred tax assets generally represent future tax benefits to be received when these carryforwards can be applied against future taxable income or when expenses previously reported in our Consolidated Financial Statements become deductible for income tax purposes. A deferred tax asset valuation allowance is required when some portion or all of the deferred tax assets may not be realized. We are required to estimate taxable income in future years or develop tax strategies that would enable tax asset realization in each taxing jurisdiction and use judgment to determine whether to record a deferred tax asset valuation allowance for part or all of a deferred tax asset.

We consider the weight of all available evidence, both positive and negative, in assessing the realizability of the deferred tax assets associated with net operating losses. We consider the reversals of existing taxable temporary differences as well as projections of future taxable income. We consider the future reversals of existing taxable temporary differences to the extent they were of the same character as the temporary differences giving rise to the deferred tax assets. We also consider whether the future reversals of existing taxable temporary differences will occur in the same period and jurisdiction as the temporary differences giving rise to the deferred tax assets. The assumptions utilized to estimate our future taxable income are consistent with those assumptions utilized for purposes of testing goodwill for impairment, as well as with our budgeting and strategic planning processes.

Significant judgment is required in evaluating our uncertain tax positions. We establish accruals for uncertain tax positions when we believe that the full amount of the associated tax benefit may not be realized. In the future, if we prevail in matters for which accruals have been established previously or pay amounts in excess of reserves, there could be a material effect on our income tax provisions in the period in which such determination is made.

We have significant tax credit carryforwards in the U.S. for which we have recorded a partial valuation allowance as a result of the Tax Cuts and Jobs Act of 2017 (the "Act"). The utilization of these credits is dependent upon the recognition of both U.S. taxable income as well as income characterized as foreign source under the U.S. tax laws. We do not expect to generate enough foreign source income in the future to utilize all of these tax credits due to law changes introduced by the Act. Nevertheless, in 2019 we expect to analyze tax planning strategies to potentially identify additional foreign source income in the carryforward period. In addition, we have significant research and development related tax credit carryforwards in Canada on which we have not recorded a valuation allowance. The utilization of these credits is dependent upon the recognition of Canadian taxable income, and we expect to generate

enough taxable income in the future to utilize these tax credits.
See Note 15, Income Taxes, to the consolidated financial statements for further information regarding income taxes.

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Goodwill and Indefinite-Lived Intangible Assets

We test our goodwill and other indefinite-lived intangible assets not subject to amortization for impairment on an annual basis during the fourth quarter or when indicators of impairment exist. We base our estimates on assumptions we believe to be reasonable, but which are not predictable with precision and therefore are inherently uncertain. Actual future results could differ from these estimates.

We test goodwill annually for impairment at the reporting unit level. A reporting unit is an operating segment, or a business unit one level below an operating segment if discrete financial information for that business is prepared and regularly reviewed by segment management. However, components within an operating segment are aggregated as a single reporting unit if they have similar economic characteristics. We determined that each of our reportable segments (Enterprise Solutions and Industrial Solutions) represents an operating segment. Within those operating segments, we have identified reporting units based on whether there is discrete financial information prepared that is regularly reviewed by segment management. As a result of this evaluation, we have identified five reporting units within Enterprise Solutions and six reporting units within Industrial Solutions for purposes of goodwill impairment testing.

The accounting guidance related to goodwill impairment testing allows for the performance of an optional qualitative assessment of whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Such an evaluation is made based on the weight of all available evidence and the significance of all identified events and circumstances that may influence the fair value of a reporting unit. If it is more likely than not that the fair value is less than the carrying value, then a quantitative assessment is required for the reporting unit, as described in the paragraph below. In 2018, we performed a qualitative assessment for seven of our reporting units, which collectively represented approximately $383 million of our consolidated goodwill balance. For those reporting units for which we performed a qualitative assessment, we determined that it was more likely than not that the fair value was greater than the carrying value, and therefore, we did not perform the calculation of fair value for these reporting units as described in the paragraph below.

When we evaluate goodwill for impairment using a quantitative assessment, we compare the fair value of each reporting unit to its carrying value. We determine the fair value using an income approach. Under the income approach, we calculate the fair value of a reporting unit based on the present value of estimated future cash flows using growth rates and discount rates that are consistent with current market conditions in our industry. If the fair value of the reporting unit exceeds the carrying value of the net assets including goodwill assigned to that unit, goodwill is not impaired. If the carrying value of the reporting unit’s net assets including goodwill exceeds the fair value of the reporting unit, then we record an impairment charge based on that difference. In addition to the income approach, we calculate the fair value of our reporting units under a market approach. The market approach measures the fair value of a reporting unit through analysis of financial multiples of comparable businesses. Consideration is given to the financial conditions and operating performance of the reporting unit being valued relative to those publicly-traded companies operating in the same or similar lines of business.

We determined that none of our goodwill was impaired during 2018. Based on our annual goodwill impairment test, the excess of the fair values over the carrying values of our four reporting units tested under a quantitative income approach ranged from 4% - 87%. The assumptions used to estimate fair values were based on the past performance of the reporting unit as well as the projections incorporated in our strategic plan. Significant assumptions included sales growth, profitability, and related cash flows, along with cash flows associated with taxes and capital spending. The discount rate used to estimate fair value was risk adjusted in consideration of the economic conditions in effect at the time of the impairment test. We also considered assumptions that market participants may use. In our quantitative assessments, the discount rates ranged from 10.1% to 14.5% and the long-term growth rates ranged from 2.0% to 3.0%. By their nature, these assumptions involve risks and uncertainties, with the primary factor that could have an adverse effect being our assumptions relating to growing revenues consistent with our strategic plan.

We test our indefinite-lived intangible assets, which consist primarily of trademarks, for impairment on an annual basis during the fourth quarter. The accounting guidance related to impairment testing for such intangible assets allows for the performance of an optional qualitative assessment, similar to that described above for goodwill. We did not perform any qualitative assessments as part of our indefinite-lived intangible asset impairment testing for 2018.

Rather, we performed a quantitative assessment for each of our indefinite-lived trademarks in 2018. Under the quantitative assessments, we determined the fair value of each trademark using a relief from royalty methodology and compared the fair value to the carrying value. We determined that none of our trademarks were impaired during 2018. Significant assumptions to determine fair value included sales growth, royalty rates, and discount rates.

We do not believe there is a reasonable likelihood that there will be a material change in the future estimates or assumptions we used to test for impairment losses on goodwill and other intangible assets. However, if actual results are significantly different from our estimates or assumptions, we may have to recognize an impairment charge that could be material.

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Pension and Other Postretirement Benefits

Our pension and other postretirement benefit costs and obligations are dependent on the various actuarial assumptions used in calculating such amounts. These assumptions relate to discount rates, salary growth, long-term return on plan assets, health care cost trend rates, mortality tables, and other factors. We base the discount rate assumptions on current investment yields on high-quality corporate long-term bonds. The salary growth assumptions reflect our long-term actual experience and future or near-term outlook. Long-term return on plan assets is determined based on historical portfolio results and management's expectation of the future economic environment. Our health care cost trend assumptions are developed based on historical cost data, the near-term outlook, and an assessment of likely long-term trends. Our key assumptions are described in further detail in Note 16 to the Consolidated Financial Statements. Actual results that differ from our assumptions are accumulated and, if in excess of the lesser of 10% of the projected benefit obligation or the fair market value of plan assets, amortized over the estimated future working life of the plan participants.

As a sensitivity measure, the effect of a 50 basis point decline in the assumed discount rate would have resulted in an increase in the 2018 net periodic benefit cost and projected benefit obligations of approximately $0.4 million and $31.8 million, respectively, as of December 31, 2018. A 50 basis point decline in the expected return on plan assets would have resulted in an increase in the 2018 net periodic benefit cost of approximately $1.6 million.

Conversely, the effect of a 50 basis point increase in the assumed discount rate would have resulted in a decrease in the 2018 net periodic benefit cost and projected benefit obligations of approximately $0.5 million and $28.3 million, respectively, as of December 31, 2018. A 50 basis point increase in the expected return on plan assets would have resulted in a decrease in the 2018 net periodic benefit cost of approximately $1.6 million.

Business Combination Accounting

We allocate the consideration of an acquired business to its identifiable assets and liabilities based on estimated fair values. The excess of the consideration over the amount allocated to the assets and liabilities, if any, is recorded to goodwill. We use all available information to estimate fair values. We typically engage third party valuation specialists to assist in the fair value determination of inventories, tangible long-lived assets, and intangible assets other than goodwill. The carrying values of acquired receivables and accounts payable have historically approximated their fair values as of the business combination date. As necessary, we may engage third party specialists to assist in the estimation of fair value for certain liabilities. We adjust the preliminary acquisition accounting, as necessary, typically up to one year after the acquisition closing date as we obtain more information regarding asset valuations and liabilities assumed.

Our acquisition accounting methodology contains uncertainties because it requires management to make assumptions and to apply judgment to estimate the fair value of acquired assets and liabilities. Management estimates the fair value of assets and liabilities based upon quoted market prices, the carrying value of the acquired assets and widely accepted valuation techniques, including discounted cash flows and market multiple analyses. Unanticipated events or circumstances may occur which could affect the accuracy of our fair value estimates, including assumptions regarding industry economic factors and business strategies.

If actual results are materially different than the assumptions we used to determine fair value of the assets and liabilities acquired through a business combination, it is possible that adjustments to the carrying values of such assets and liabilities will have an impact on our net earnings.

See Note 4 to the Consolidated Financial Statements for the acquisition-related information associated with significant acquisitions completed in the last three fiscal years.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Market risks relating to our operations result primarily from currency exchange rates, certain commodity prices, interest rates, and credit extended to customers. Each of these risks is discussed below.

Currency Exchange Rate Risk

We are exposed to foreign currency risks that arise from normal business operations. These risks include the translation of local currency balances of foreign subsidiaries and transactions denominated in currencies other than a location's functional currency.

Our investments in certain foreign subsidiaries are recorded in currencies other than the U.S. dollar. As these foreign currency denominated investments are translated at the end of each period during consolidation using period-end exchange rates, fluctuations of exchange rates between the foreign currency and the U.S. dollar increase or decrease the value of those investments. These fluctuations and the results of operations for foreign subsidiaries, where the functional currency is not the U.S. dollar, are translated

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into U.S. dollars using the average exchange rates during the year, while the assets and liabilities are translated using period end exchange rates. The assets and liabilities-related translation adjustments are recorded as a separate component of accumulated other comprehensive income (loss) in our Consolidated Balance Sheets. We generally view our investments in international subsidiaries with functional currencies other than the U.S. dollar as long-term. As a result, we do not generally use derivatives to manage these net investments. However, we designated euro debt issued in 2018, 2017 and 2016 by Belden Inc., a USD functional currency entity, as a net investment hedge of certain international subsidiaries. See Note 14 for further discussion.

Transactions denominated in currencies other than a location's functional currency may produce receivables or payables that are fixed in terms of the amount of foreign currency that will be received or paid. A change in exchange rates between the functional currency and the currency in which a transaction is denominated increases or decreases the expected amount of functional currency cash flows upon settlement of the transaction. That increase or decrease in expected functional currency cash flows is a foreign exchange transaction gain or loss that is included in our operating income in the Consolidated Statements of Operations. In 2018, we recorded approximately $2.3 million of net foreign currency transaction losses.

Generally, the currency in which we sell our products is the same as the currency in which we incur the costs to manufacture our products, resulting in a natural hedge. Our currency exchange rate management strategy primarily involves the use of natural techniques, where possible, such as the offsetting or netting of like-currency cash flows. However, we re-evaluate our strategy as the foreign currency environment changes, and it is possible that we could utilize derivative financial instruments to manage this risk in the future. We did not have any foreign currency derivatives outstanding as of December 31, 2018.

Our exposure to currency rate fluctuations primarily relates to exchange rate movements between the U.S. dollar and the euro, Canadian dollar, Hong Kong dollar, Chinese yuan, Japanese yen, Mexican peso, Australian dollar, British pound, Indian rupee, and Brazilian real.

Commodity Price Risk

Certain raw materials used by us are subject to price volatility caused by supply conditions, political and economic variables, and other unpredictable factors. The primary purpose of our commodity price management activities is to manage the volatility associated with purchases of commodities in the normal course of business. We do not speculate on commodity prices.

We are exposed to price risk related to our purchase of copper used in our products, although we are generally able to raise selling prices to customers to cover the increase in copper costs. Our copper price management strategy involves the use of natural techniques, where possible, such as purchasing copper for future delivery at fixed prices. We do not generally use commodity price derivatives and did not have any outstanding at December 31, 2018 or 2017.

The following table presents unconditional commodity purchase obligations outstanding as of December 31, 2018. The unconditional purchase obligations will settle during 2019.

	Purchase Amount	Fair Value
	(In thousands, except average price)	
Unconditional copper purchase obligations:		
Commitment volume in pounds	1,807	
Weighted average price per pound	$ 2.76	
Commitment amounts	$ 4,994	$ 4,770

We are also exposed to price risk related to our purchase of selected commodities derived from petrochemical feedstocks used in our products. We generally purchase these commodities based upon market prices established with the vendors as part of the purchase process. Pricing of these commodities is volatile as they tend to fluctuate with the price of oil. Historically, we have not used commodity financial instruments to hedge prices for commodities derived from petrochemical feedstocks.

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Interest Rate Risk
We have occasionally managed our debt portfolio by using interest rate derivative instruments, such as swap agreements, to achieve an overall desired position of fixed and floating rates. We were not a party to any interest rate derivative instruments as of or for the years ended December 31, 2018 or 2017.

The following table provides information about our financial instruments that are sensitive to changes in interest rates. The table presents principal amounts by expected maturity dates and fair values as of December 31, 2018.

	Principal Amount by Expected Maturity			Fair Value
	2019	Thereafter	Total	
	(In thousands, except interest rates)			
€350.0 million fixed-rate senior subordinated notes due 2028	$ —	$400,050	$400,050	$390,777
Average interest rate		3.875 %		
€450.0 million fixed-rate senior subordinated notes due 2027	$ —	$514,350	$514,350	$523,912
Average interest rate		3.375 %		
€200.0 million fixed-rate senior subordinated notes due 2026	$ —	$228,600	$228,600	$225,171
Average interest rate		4.125 %		
€300.0 million fixed-rate senior subordinated notes due 2025	$ —	$342,900	$342,900	$345,136
Average interest rate		2.875 %		
Total			$1,485,900	$1,484,996

Concentrations of Credit Risk
Financial instruments that potentially subject us to significant concentrations of credit risk consist of cash and cash equivalents and accounts receivable. We are exposed to credit losses in the event of nonperformance by counterparties to these financial instruments. We place cash and cash equivalents with various high-quality financial institutions throughout the world, and exposure is limited at any one financial institution. Although we do not obtain collateral or other security to support these financial instruments, we evaluate the credit standing of the counterparty financial institutions. As of December 31, 2018, we had $37.0 million in accounts receivable outstanding from Anixter International Inc. This represented approximately 8% of our total accounts receivable outstanding at December 31, 2018. Anixter generally pays all outstanding receivables within thirty to sixty days of invoice receipt.

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Item 8. Financial Statements and Supplementary Data

Report of Independent Registered Public Accounting Firm

The Stockholders and the Board of Directors of Belden Inc.

Opinion on the Financial Statements

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

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission 2013 framework and our report dated February 20, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP
We have served as the Company's auditor since 1993.
St. Louis, Missouri
February 20, 2019

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Belden Inc.
Consolidated Balance Sheets

	December 31, 2018	2017
	(In thousands, except par value)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 420,610	$ 561,108
Receivables, net	465,939	473,570
Inventories, net	316,418	297,226
Other current assets	55,757	40,167
Total current assets	1,258,724	1,372,071
Property, plant and equipment, less accumulated depreciation	365,970	337,322
Goodwill	1,557,653	1,478,257
Intangible assets, less accumulated amortization	511,093	545,207
Deferred income taxes	56,018	42,549
Other long-lived assets	29,863	65,207
	$ 3,779,321	$ 3,840,613
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 352,646	$ 376,277
Accrued liabilities	364,276	302,651
Total current liabilities	716,922	678,928
Long-term debt	1,463,200	1,560,748
Postretirement benefits	132,791	102,085
Deferred income taxes	39,943	27,713
Other long-term liabilities	38,877	36,273
Stockholders' equity:		
Preferred stock, par value $0.01 per share— 2,000 shares authorized; 52 shares outstanding	1	1
Common stock, par value $0.01 per share— 200,000 shares authorized; 50,335 shares issued; 39,396 and 42,019 shares outstanding at 2018 and 2017, respectively	503	503
Additional paid-in capital	1,139,395	1,123,832
Retained earnings	922,000	833,610
Accumulated other comprehensive loss	(74,907)	(98,026)
Treasury stock, at cost— 10,939 and 8,316 shares at 2018 and 2017, respectively	(599,845)	(425,685)
Total Belden stockholders' equity	1,387,147	1,434,235
Noncontrolling interest	441	631
Total stockholders' equity	1,387,588	1,434,866
	$ 3,779,321	$ 3,840,613

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Belden Inc.
Consolidated Statements of Operations

	Years Ended December 31,		
	2018	2017	2016
	(In thousands, except per share amounts)		
Revenues	$2,585,368	$2,388,643	$2,356,672
Cost of sales	(1,576,956)	(1,453,890)	(1,375,351)
Gross profit	1,008,412	934,753	981,321
Selling, general and administrative expenses	(525,918)	(461,022)	(486,403)
Research and development expenses	(140,585)	(134,330)	(140,519)
Amortization of intangibles	(98,829)	(103,997)	(98,385)
Gain from patent litigation	62,141	—	—
Impairment of assets held for sale	—	—	(23,931)
Operating income	305,221	235,404	232,083
Interest expense, net	(61,559)	(82,901)	(95,050)
Non-operating pension cost	(342)	(714)	(8,230)
Loss on debt extinguishment	(22,990)	(52,441)	(2,342)
Income before taxes	220,330	99,348	126,461
Income tax benefit (expense)	(59,619)	(6,495)	1,185
Net income	160,711	92,853	127,646
Less: Net loss attributable to noncontrolling interest	(183)	(357)	(357)
Net income attributable to Belden	160,894	93,210	128,003
Less: Preferred stock dividends	34,931	34,931	15,428
Net income attributable to Belden common stockholders	$125,963	$58,279	$112,575
Weighted average number of common shares and equivalents:			
Basic	40,675	42,220	42,093
Diluted	40,956	42,643	42,557
Basic income per share attributable to Belden common stockholders:	$3.10	$1.38	$2.67
Diluted income per share attributable to Belden common stockholders:	$3.08	$1.37	$2.65

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Belden Inc.
Consolidated Statements of Comprehensive Income

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Net income	$160,711	$92,853	$127,646
Foreign currency translation, net of tax of $1.7 million, $1.3 million, and $1.2 million, respectively	27,802	(65,046)	18,687
Adjustments to pension and postretirement liability, net of tax of $1.0 million, $2.2 million, and $1.9 million, respectively	(4,690)	6,071	1,170
Other comprehensive income (loss), net of tax	23,112	(58,975)	19,857
Comprehensive income	183,823	33,878	147,503
Less: Comprehensive loss attributable to noncontrolling interest	(190)	(373)	(420)
Comprehensive income attributable to Belden	$184,013	$34,251	$147,923

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Belden Inc.
Consolidated Cash Flow Statements

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Cash flows from operating activities:			
Net income	$160,711	$92,853	$127,646
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	148,632	149,650	145,593
Impairment of assets held for sale	—	—	23,931
Share-based compensation	18,497	14,647	18,178
Loss on debt extinguishment	22,990	52,441	2,342
Deferred income tax expense (benefit)	11,300	(24,098)	(30,034)
Changes in operating assets and liabilities, net of the effects of currency exchange rate changes and acquired businesses:			
Receivables	(21,748)	(24,931)	(10,115)
Inventories	(14,779)	(84,088)	2,677
Accounts payable	(29,401)	100,752	39,298
Accrued liabilities	17,238	(25,076)	(13,181)
Income taxes	(4,390)	5,001	11,722
Other assets	(18,748)	(13,255)	760
Other liabilities	(1,082)	11,404	(4,023)
Net cash provided by operating activities	289,220	255,300	314,794
Cash flows from investing activities:			
Capital expenditures	(97,847)	(64,261)	(53,974)
Cash used to acquire businesses, net of cash acquired	(84,580)	(166,896)	(18,848)
Other	—	—	(827)
Proceeds from disposal of tangible assets	1,580	1,039	392
Proceeds from disposal of business	40,171	—	—
Net cash used for investing activities	(140,676)	(230,118)	(73,257)
Cash flows from financing activities:			
Payments under borrowing arrangements	(484,757)	(1,105,892)	(294,375)
Payments under share repurchase program	(175,000)	(25,000)	—
Cash dividends paid	(43,169)	(43,376)	(16,079)
Debt issuance costs paid	(7,609)	(17,316)	(3,910)
Withholding tax payments for share based-payment awards	(2,094)	(6,564)	(7,480)
Redemption of stockholders' rights agreement	(411)	—	—
Proceeds from the issuance of preferred stock, net	—	—	501,498
Borrowings under credit arrangements	431,270	866,700	222,050
Net cash provided by (used for) financing activities	(281,770)	(331,448)	401,704
Effect of foreign currency exchange rate changes on cash and cash equivalents	(7,272)	19,258	(11,876)
Increase (decrease) in cash and cash equivalents	(140,498)	(287,008)	631,365
Cash and cash equivalents, beginning of period	561,108	848,116	216,751
Cash and cash equivalents, end of period	$420,610	$561,108	$848,116

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Belden Inc.
Consolidated Stockholders' Equity Statements

	Belden Inc. Stockholders										
	Mandatory Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Non-controlling Interest	Total
	Shares	Amount	Shares	Amount			Shares	Amount			
	(In thousands)										
Balance at December 31, 2015	—	$—	50,335	$503	$605,660	$679,716	(8,354)	$(402,793)	$(58,987)	$1,424	$825,523
Net income (loss)	—		—	—	—	128,003	—	—	—	(357)	127,646
Other comprehensive income, net of tax	—	—	—	—	—	—	—	—	19,920	(63)	19,857
Preferred stock issuance, net	52	1	—	—	501,497	—	—	—	—	—	501,498
Exercise of stock options, net of tax withholding forfeitures	—	—	—	—	(4,205)	—	76	117	—	—	(4,088)
Conversion of restricted stock units into common stock, net of tax withholding forfeitures	—	—	—	—	(5,040)	—	123	1,650	—	—	(3,390)
Share-based compensation related items	—	—	—	—	18,178	—	—	—	—	—	18,178
Preferred stock dividends	—	—	—	—	—	(15,428)	—	—	—	—	(15,428)
Common stock dividends ($0.20 per share)	—	—	—	—	—	(8,479)	—	—	—	—	(8,479)
Balance at December 31, 2016	52	$1	50,335	$503	$1,116,090	$783,812	(8,155)	$(401,026)	$(39,067)	$1,004	$1,461,317
Net income (loss)	—	—	—	—	—	93,210	—	—	—	(357)	92,853
Other comprehensive loss, net of tax	—	—	—	—	—	—	—	—	(58,959)	(16)	(58,975)

Exercise of stock options, net of tax withholding forfeitures	—	—	—	—	(2,635)	—	55	(203)	—	—	(2,838)
Conversion of restricted stock units into common stock, net of tax withholding forfeitures	—	—	—	—	(4,270)	—	97	544	—	—	(3,726)
Share repurchase program	—	—	—	—	—	—	(313)	(25,000)	—	—	(25,000)
Share-based compensation	—	—	—	—	14,647	—	—	—	—	—	14,647
Preferred stock dividends	—	—	—	—	—	(34,931)	—	—	—	—	(34,931)
Common stock dividends ($0.20 per share)	—	—	—	—	—	(8,481)	—	—	—	—	(8,481)
Balance at December 31, 2017	52	$1	50,335	$503	$1,123,832	$833,610	(8,316)	$(425,685)	$(98,026)	$631	$1,434,866
Cumulative effect of change in accounting principles	—	—	—	—	—	(29,041)	—	—	—	—	(29,041)
Net income (loss)	—	—	—	—	—	160,894	—	—	—	(183)	160,711
Other comprehensive income, net of tax	—	—	—	—	—	—	—	—	23,119	(7)	23,112
Exercise of stock options, net of tax withholding forfeitures	—	—	—	—	(883)	—	20	118	—	—	(765)
Conversion of restricted stock units into common stock, net of tax withholding forfeitures	—	—	—	—	(2,051)	—	51	722	—	—	(1,329)
Share repurchase	—	—	—	—	—	—	(2,694)	(175,000)	—	—	(175,000)

program											
Share-based compensation	—	—	—	—	18,497	—	—	—	—	—	18,497
Redemption of stockholders' rights agreement	—	—	—	—	—	(411)	—	—	—	—	(411)
Preferred stock dividends	—	—	—	—	—	(34,931)	—	—	—	—	(34,931)
Common stock dividends ($0.20 per share)	—	—	—	—	—	(8,121)	—	—	—	—	(8,121)
Balance at December 31, 2018	52	$1	50,335	$503	$1,139,395	$922,000	(10,939)	$(599,845)	$(74,907)	$441	$1,387,588

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Notes to Consolidated Financial Statements

Note 1: Basis of Presentation

Business Description

Belden Inc. (the Company, us, we, or our) is a signal transmission solutions company built around two global business platforms – Enterprise Solutions and Industrial Solutions. Our comprehensive portfolio of signal transmission solutions provides industry leading secure and reliable transmission of data, sound, and video for mission critical applications. We sell our products to distributors, end-users, installers, and directly to original equipment manufacturers (OEMs).

Consolidation

The accompanying Consolidated Financial Statements include Belden Inc. and all of its subsidiaries, including variable interest entities for which we are the primary beneficiary. We eliminate all significant affiliate accounts and transactions in consolidation.

Foreign Currency

For international operations with functional currencies other than the United States (U.S.) dollar, we translate assets and liabilities at current exchange rates; we translate income and expenses using average exchange rates. We report the resulting translation adjustments, as well as gains and losses from certain affiliate transactions, in accumulated other comprehensive income (loss), a separate component of stockholders' equity. We include exchange gains and losses on transactions in operating income.

We determine the functional currency of our foreign subsidiaries based upon the currency of the primary economic environment in which each subsidiary operates. Typically, that is determined by the currency in which the subsidiary primarily generates and expends cash. We have concluded that the local currency is the functional currency for all of our material subsidiaries.

Reporting Periods

Our fiscal year and fiscal fourth quarter both end on December 31. Our fiscal first quarter ends on the Sunday falling closest to 91 days after December 31. Our fiscal second and third quarters each have 91 days.

Use of Estimates in the Preparation of the Financial Statements

The preparation of financial statements in conformity with accounting principles generally accepted in the U.S. requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, and operating results and the disclosure of contingencies. Actual results could differ from those estimates. We make significant estimates with respect to the collectability and valuation of receivables, the valuation of inventory, the realization of deferred tax assets, the valuation of goodwill and indefinite-lived intangible assets, the valuation of contingent liabilities, the calculation of share-based compensation, the calculation of pension and other postretirement benefits expense, and the valuation of acquired businesses.

Reclassifications

We have made certain reclassifications to the 2017 and 2016 Condensed Consolidated Financial Statements, including those related to the adoption of Accounting Standards Update No. 2017-07, Compensation - Retirement Benefits: Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost (ASU 2017-07) and our segment change, with no impact to reported net income in order to conform to the 2018 presentation. See Note 5.

Note 2: Summary of Significant Accounting Policies

Fair Value Measurement

Accounting guidance for fair value measurements specifies a hierarchy of valuation techniques based upon whether the inputs to those valuation techniques reflect assumptions other market participants would use based upon market data obtained from independent sources or reflect our own assumptions of market participant valuation. The hierarchy is broken down into three levels based on the reliability of the inputs as follows:

- Level 1 – Quoted prices in active markets that are unadjusted and accessible at the measurement date for identical, unrestricted assets or liabilities;

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- Level 2 – Quoted prices for identical assets and liabilities in markets that are not active, quoted prices for similar assets and liabilities in active markets, or financial instruments for which significant inputs are observable, either directly or indirectly; and
- Level 3 – Prices or valuations that require inputs that are both significant to the fair value measurement and unobservable.

During 2018, 2017, and 2016 we utilized Level 1 inputs to determine the fair value of cash equivalents, and Level 3 inputs to determine the fair value of net assets acquired in business combinations (see Note 4) and for our annual impairment testing (see Note 10). We did not have any transfers between Level 1 and Level 2 fair value measurements during 2018.

Cash and Cash Equivalents

We classify cash on hand and deposits in banks, including commercial paper, money market accounts, and other investments with an original maturity of three months or less, that we hold from time to time, as cash and cash equivalents. We periodically have cash equivalents consisting of short-term money market funds and other investments. As of December 31, 2018 and 2017, we did not have any such cash equivalents on hand. The primary objective of our investment activities is to preserve our capital for the purpose of funding operations. We do not enter into investments for trading or speculative purposes.

Accounts Receivable

We classify amounts owed to us and due within twelve months, arising from the sale of goods or services and from other business activities, as current receivables. We classify receivables due after twelve months as other long-lived assets.

At the time of sale, we establish an estimated reserve for trade, promotion, and other special price reductions such as contract pricing, discounts to meet competitor pricing, and on-time payment discounts. We also adjust receivable balances for, among other things, correction of billing errors, incorrect shipments, and settlement of customer disputes. Customers are allowed to return inventory if and when certain conditions regarding the physical state of the inventory and our approval of the return are met. Certain distribution customers are allowed to return inventory at original cost, in an amount not to exceed three percent of the prior year's purchases, in exchange for an order of equal or greater value. Until we can process these reductions, corrections, and returns (together, the Changes) through individual customer records, we estimate the amount of outstanding Changes and recognize them by reducing revenues and accounts receivable. We also adjust inventory and cost of sales for the estimated level of returns. We base these estimates on historical and anticipated sales demand, trends in product pricing, and historical and anticipated Changes patterns. We make revisions to these estimates in the period in which the facts that give rise to each revision become known. Future market conditions might require us to take actions to further reduce prices and increase customer return authorizations. Unprocessed Changes recognized against our gross accounts receivable balance at December 31, 2018 and 2017 totaled $25.7 million and $35.7 million, respectively.

We evaluate the collectability of accounts receivable based on the specific identification method. A considerable amount of judgment is required in assessing the realizability of accounts receivable, including the current creditworthiness of each customer and related aging of the past due balances. We perform ongoing credit evaluations of our customers' financial condition. Through these evaluations, we may become aware of a situation where a customer may not be able to meet its financial obligations due to deterioration of its financial viability, credit ratings, or bankruptcy. We record a specific reserve for bad debts against amounts due to reduce the receivable to its estimated collectible balance. We recognized bad debt expense, net of recoveries, of $1.0 million, $0.0 million, and $1.5 million in 2018, 2017, and 2016, respectively. The allowance for doubtful accounts at December 31, 2018 and 2017 totaled $8.2 million and $7.8 million, respectively.

Inventories and Related Reserves

Inventories are stated at the lower of cost or net realizable value. We determine the cost of all raw materials, work-in-process, and finished goods inventories by the first in, first out method. Cost components of inventories include direct labor, applicable production overhead, and amounts paid to suppliers of materials and products as well as freight costs and, when applicable, duty costs to import the materials and products.

We evaluate the realizability of our inventory on a product-by-product basis in light of historical and anticipated sales demand, technological changes, product life cycle, component cost trends, product pricing, and inventory condition. In circumstances where inventory levels are in excess of anticipated market demand, where inventory is deemed technologically obsolete or not saleable due to condition, or where inventory cost exceeds net realizable value, we record a charge to cost of sales and reduce the inventory to its net realizable value. The allowances for excess and obsolete inventories at December 31, 2018 and 2017 totaled $28.9 million and $25.3 million, respectively.

Property, Plant and Equipment

We record property, plant and equipment at cost. We calculate depreciation on a straight-line basis over the estimated useful lives of the related assets ranging from 10 to 40 years for buildings, 5 to 12 years for machinery and equipment, and 5 to 10 years for computer equipment and software. Construction in process reflects amounts incurred for the configuration and build-out of property, plant and equipment and for property, plant and equipment not yet placed into service. We charge maintenance and repairs—both planned major activities and less-costly, ongoing activities—to expense as incurred. We capitalize interest costs associated with the construction of capital assets and amortize the costs over the assets' useful lives. Depreciation expense is included in costs of sales; selling, general and administrative expenses; and research and development expenses in the Consolidated Statements of Operations based on the specific categorization and use of the underlying assets being depreciated.

We review property, plant and equipment to determine whether an event or change in circumstances indicates the carrying values of the assets may not be recoverable. We base our evaluation on the nature of the assets, the future economic benefit of the assets, and any historical or future profitability measurements, as well as other external market conditions or factors that may be present. If such impairment indicators are present or other factors exist that indicate that the carrying amount of an asset may not be recoverable, we determine whether impairment has occurred through the use of an undiscounted cash flow analysis. If impairment has occurred, we recognize a loss for the difference between the carrying amount and the fair value of the asset.

For purposes of impairment testing of long-lived assets, we have identified asset groups at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. Generally, our asset groups are based on an individual plant or operating facility level. In some circumstances, however, a combination of plants or operating facilities may be considered the asset group due to interdependence of operational activities and cash flows.

Goodwill and Intangible Assets

Our intangible assets consist of (a) definite-lived assets subject to amortization such as developed technology, customer relationships, certain in-service research and development, certain trademarks, backlog, and capitalized software intangible assets, and (b) indefinite-lived assets not subject to amortization such as goodwill, certain trademarks, and certain in-process research and development intangible assets. We record amortization of the definite-lived intangible assets over the estimated useful lives of the related assets, which generally range from one year or less for backlog to more than 25 years for certain of our customer relationships. We determine the amortization method for our definite-lived intangible assets based on the pattern in which the economic benefits of the intangible asset are consumed. In the event we cannot reliably determine that pattern, we utilize a straight-line amortization method.

We test our goodwill and other indefinite-lived intangible assets not subject to amortization for impairment on an annual basis as of our fiscal November month-end or when indicators of impairment exist. We base our estimates on assumptions we believe to be reasonable, but which are not predictable with precision and therefore are inherently uncertain. Actual future results could differ from these estimates.

The accounting guidance related to goodwill impairment testing allows for the performance of an optional qualitative assessment of whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Such an evaluation is made based on the weight of all available evidence and the significance of all identified events and circumstances that may influence the fair value of a reporting unit. If it is more likely than not that the fair value is less than the carrying value, then a quantitative assessment is required for the reporting unit, as described in the paragraph below. In 2018, we performed a qualitative assessment for seven of our reporting units, which collectively represented approximately $383.4 million of our consolidated goodwill balance. For those reporting units for which we performed a qualitative assessment, we determined that it was more likely than not that the fair value was greater than the carrying value, and therefore, we did not perform the calculation of fair value for these reporting units as described in the paragraph below.

For our annual impairment test in 2018, we performed a quantitative assessment for four of our reporting units, which collectively represented approximately $1,174.3 million of our consolidated goodwill balance. Under a quantitative assessment for goodwill impairment, we determine the fair value using the income approach (using Level 3 inputs) as reconciled to our aggregate market capitalization. Under the income approach, we calculate the fair value of a reporting unit based on the present value of estimated future cash flows. If the fair value of the reporting unit exceeds the carrying value of the net assets including goodwill assigned to that unit, goodwill is not impaired. If the carrying value of the reporting unit's net assets including goodwill exceeds the fair value of the reporting unit, then we record an impairment charge based on that difference. In addition to the income approach, we

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calculate the fair value of our reporting units under a market approach. The market approach measures the fair value of a reporting unit through analysis of financial multiples of comparable businesses. Consideration is given to the financial conditions and operating performance of the reporting unit being valued relative to those publicly-traded companies operating in the same or similar lines of business. The fair values of the four reporting units tested under a quantitative approach were in excess of the carrying values as of the impairment testing date.

We did not recognize any goodwill impairment in 2018, 2017, or 2016. See Note 10 for further discussion.

We also evaluate indefinite lived intangible assets for impairment annually or at other times if events have occurred or circumstances exist that indicate the carrying values of those assets may no longer be recoverable. We compare the fair value of the asset with its carrying amount. If the carrying amount of the asset exceeds its fair value, we recognize an impairment loss in an amount equal to that excess. We did not recognize impairment charges for our indefinite lived intangible assets in 2018, 2017, or 2016. See Note 10 for further discussion.

We review intangible assets subject to amortization whenever an event or change in circumstances indicates the carrying values of the assets may not be recoverable. We test intangible assets subject to amortization for impairment and estimate their fair values using the same assumptions and techniques we employ on property, plant and equipment. We did not recognize any impairment charges for amortizable intangible assets in 2018, 2017, or 2016.

Disposals

During 2018, we sold a previously closed operating facility for net proceeds of $1.5 million and recognized a $0.6 million gain on the sale.

During the fourth quarter of 2016, we committed to a plan to sell our MCS business and 50% ownership interest in Xuzhou Hirschmann Electronics Co. Ltd (the Hirschmann JV) and determined that we met all of the criteria to classify the assets and liabilities of these businesses as held for sale. The MCS business was part of the Industrial Solutions segment and the Hirschmann JV was an equity method investment that was not included in an operating segment. The MCS business operated in Germany and the United States, and the Hirschmann JV was an equity method investment located in China. During 2016, we reached an agreement in principle to sell this disposal group for a total sales price of $39 million plus a working capital adjustment. As the carrying value of the disposal group exceeded the fair value less costs to sell, which we determined based on the expected sales price, by $23.9 million, we recognized an impairment charge equal to this amount in 2016. In 2017, we sold the MCS business and Hirschmann JV for a total purchase price of $40.2 million and recognized a loss on sale of the assets of $1.0 million, which was included in selling, general and administrative expenses. This loss included $2.8 million of accumulated other comprehensive losses that were recognized as a result of the sale. We collected the $40.2 million proceeds from the sale during 2018.

Pension and Other Postretirement Benefits

Our pension and other postretirement benefit costs and obligations are dependent on the various actuarial assumptions used in calculating such amounts. These assumptions relate to discount rates, salary growth, long-term return on plan assets, health care cost trend rates, mortality tables, and other factors. We base the discount rate assumptions on current investment yields on high-quality corporate long-term bonds. The salary growth assumptions reflect our long-term actual experience and future or near-term outlook. We determine the long-term return on plan assets based on historical portfolio results and management’s expectation of the future economic environment. Our health care cost trend assumptions are developed based on historical cost data, the near-term outlook, and an assessment of likely long-term trends. Actual results that differ from our assumptions are accumulated and, if in excess of the lesser of 10% of the projected benefit obligation or the fair market value of plan assets, are amortized over the estimated future working life of the plan participants.

Accrued Sales Rebates

We grant incentive rebates to participating customers as part of our sales programs. The rebates are determined based on certain targeted sales volumes. Rebates are paid quarterly or annually in either cash or receivables credits. Until we can process these rebates through individual customer records, we estimate the amount of outstanding rebates and recognize them as accrued liabilities and reductions in our gross revenues. We base our estimates on both historical and anticipated sales demand and rebate program participation. We charge revisions to these estimates back to accrued liabilities and revenues in the period in which the facts that give rise to each revision become known. Future market conditions and product transitions might require us to take actions to increase sales rebates offered, possibly resulting in an incremental increase in accrued liabilities and an incremental reduction in

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revenues at the time the rebate is offered. Accrued sales rebates at December 31, 2018 and 2017 totaled $41.3 million and $38.0 million, respectively.

Contingent Liabilities

We have established liabilities for environmental and legal contingencies that are probable of occurrence and reasonably estimable, the amounts of which are currently not material. A significant amount of judgment and use of estimates is required to quantify our ultimate exposure in these matters. We review the valuation of these liabilities on a quarterly basis, and we adjust the balances to account for changes in circumstances for ongoing and emerging issues.

We accrue environmental remediation costs based on estimates of known environmental remediation exposures developed in consultation with our environmental consultants and legal counsel, the amounts of which are not currently material. We expense environmental compliance costs, which include maintenance and operating costs with respect to ongoing monitoring programs, as incurred. We evaluate the range of potential costs to remediate environmental sites. The ultimate cost of site clean-up is difficult to predict given the uncertainties of our involvement in certain sites, uncertainties regarding the extent of the required clean-up, the availability of alternative clean-up methods, variations in the interpretation of applicable laws and regulations, the possibility of insurance recoveries with respect to certain sites, and other factors.

We are, from time to time, subject to routine litigation incidental to our business. These lawsuits primarily involve claims for damages arising out of the use of our products, allegations of patent or trademark infringement, and litigation and administrative proceedings involving employment matters and commercial disputes. Assessments regarding the ultimate cost of lawsuits require judgments concerning matters such as the anticipated outcome of negotiations, the number and cost of pending and future claims, and the impact of evidentiary requirements. Based on facts currently available, we believe the disposition of the claims that are pending or asserted will not have a materially adverse effect on our financial position, results of operations or cash flow.

Business Combination Accounting

We allocate the consideration of an acquired business to its identifiable assets and liabilities based on estimated fair values. The excess of the consideration over the amount allocated to the assets and liabilities, if any, is recorded to goodwill. We use all available information to estimate fair values. We typically engage third party valuation specialists to assist in the fair value determination of inventories, tangible long-lived assets, and intangible assets other than goodwill. The carrying values of acquired receivables and accounts payable have historically approximated their fair values as of the business combination date. As necessary, we may engage third party specialists to assist in the estimation of fair value for certain liabilities, such as deferred revenue or postretirement benefit liabilities. We adjust the preliminary acquisition accounting, as necessary, typically up to one year after the acquisition closing date as we obtain more information regarding asset valuations and liabilities assumed.

Revenue Recognition

We recognize revenue consistent with the principles as outlined in the following five step model: (1) identify the contract with the customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when (or as) each performance obligation is satisfied. See Note 3.

Gain from Patent Litigation

On July 5, 2011, the Company's wholly-owned subsidiary, PPC, filed an action for patent infringement against Corning alleging that Corning infringed two of PPC's patents. In July 2015, a jury found that Corning willfully infringed both patents. Following a series of appeals, we received a pre-tax amount of approximately $62.1 million from Corning on July 19, 2018. We recorded the $62.1 million of cash received as a pre-tax gain from patent litigation during 2018. Prior to 2018, we had not recognized any amounts in our consolidated financial statements related to this matter. On September 27, 2018, Corning filed a petition for certiorari review by the U.S. Supreme Court. On December 10, 2018, Corning's certiorari review by the Supreme Court was denied, thus exhausting their opportunities for further appellate relief.

Cost of Sales

Cost of sales includes our total cost of inventory sold during the period, including material, labor, production overhead costs, variable manufacturing costs, and fixed manufacturing costs. Production overhead costs include operating supplies, applicable utility expenses, maintenance costs, and scrap. Variable manufacturing costs include inbound, interplant, and outbound freight, inventory shrinkage, and charges for excess and obsolete inventory. Fixed manufacturing costs include the costs associated with our purchasing, receiving, inspection, warehousing, distribution centers, production and inventory control, and manufacturing management. Cost of sales also includes the costs to provide maintenance and support and other professional services.

Shipping and Handling Costs

We recognize fees earned on the shipment of product to customers as revenues and recognize costs incurred on the shipment of product to customers as a cost of sales.

Selling, General and Administrative Expenses

Selling, general and administrative expenses include expenses not directly related to the production of inventory. They include all expenses related to selling and marketing our products, as well as the salary and benefit costs of associates performing the selling and marketing functions. Selling, general and administrative expenses also include salary and benefit costs, purchased services, and other costs related to our executive and administrative functions.

Research and Development Costs

Research and development costs are expensed as incurred.

Advertising Costs

Advertising costs are expensed as incurred. Advertising costs were $23.5 million, $25.0 million, and $27.2 million for 2018, 2017, and 2016, respectively.

Share-Based Compensation

We compensate certain employees and non-employee directors with various forms of share-based payment awards and recognize compensation costs for these awards based on their fair values. We estimate the fair values of certain awards, primarily stock appreciation rights (SARs), on the grant date using the Black-Scholes-Merton option-pricing formula, which incorporates certain assumptions regarding the expected term of an award and expected stock price volatility. We develop the expected term assumption based on the vesting period and contractual term of an award, our historical exercise and cancellation experience, our stock price history, plan provisions that require exercise or cancellation of awards after employees terminate, and the extent to which currently available information indicates that the future is reasonably expected to differ from past experience. We develop the expected volatility assumption based on historical price data for our common stock. We estimate the fair value of certain restricted stock units with service vesting conditions and performance vesting conditions based on the grant date stock price. We estimate the fair value of certain restricted stock units with market conditions using a Monte Carlo simulation valuation model with the assistance of a third party valuation firm.

After calculating the aggregate fair value of an award, we use an estimated forfeiture rate to discount the amount of share-based compensation cost expected to be recognized in our operating results over the service period of the award. We develop the forfeiture assumption based on our historical pre-vesting cancellation experience.

Income Taxes

Income taxes are provided based on earnings reported for financial statement purposes. The provision for income taxes differs from the amounts currently payable to taxing authorities because of the recognition of revenues and expenses in different periods for income tax purposes than for financial statement purposes. Income taxes are provided as if operations in all countries, including the U.S., were stand-alone businesses filing separate tax returns.

We recognize deferred tax assets resulting from tax credit carryforwards, net operating loss carryforwards, and deductible temporary differences between taxable income on our income tax returns and pretax income on our financial statements. Deferred tax assets generally represent future tax benefits to be received when these carryforwards can be applied against future taxable income or when expenses previously reported in our Consolidated Financial Statements become deductible for income tax purposes. A deferred tax asset valuation allowance is required when some portion or all of the deferred tax assets may not be realized. At December 31, 2018 the valuation allowance of $90.9 million was primarily related to net operating losses and foreign tax credits that we are not expected to realize.

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Our effective tax rate is based on expected income, statutory tax rates, and tax planning opportunities available to us in the various jurisdictions in which we operate. Significant judgment is required in determining our effective tax rate and in evaluating our tax positions. We establish accruals for uncertain tax positions when we believe that the full amount of the associated tax benefit may not be realized. To the extent we were to prevail in matters for which accruals have been established or would be required to pay amounts in excess of reserves, there could be a material effect on our income tax provisions in the period in which such determination is made.

On December 22, 2017, the "Tax Cuts and Jobs Act" (the "Act") was signed into law, making significant changes to the U.S. Internal Revenue Code. Changes include, but are not limited to, a corporate tax rate decrease from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial tax system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. In accordance with the Act, we recorded $28.4 million as additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. The total income tax expense included a $36.0 million tax benefit for the remeasurement of deferred tax assets and liabilities to the 21% rate at which they are expected to reverse, offset with a one-time tax expense on deemed repatriation of $29.1 million and a valuation allowance of $35.3 million recorded against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law. Additionally, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. GAAP 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 Act. December 22, 2018 marked the end of the measurement period for purposes of SAB 118. As such, we have completed our analysis based on legislative updates relating to the Act currently available which resulted in an additional SAB 118 tax expense of $10.0 million for the year ended December 31, 2018. The total tax expense included an $8.0 million tax expense associated with an increase to the valuation allowance against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law, a $1.3 million tax expense adjustment to the transition tax on the deemed repatriation of cumulative foreign earnings, a $1.1 million tax expense resulting from a valuation allowance established on the deferred tax assets associated with stock options of covered employees, and a $0.4 million income tax benefit associated with an adjustment to the remeasurement of certain deferred tax assets and liabilities. See Note 15, Income Taxes, in the accompanying notes to our consolidated financial statements.

Current-Year Adoption of Accounting Pronouncements

In May 2014, the FASB issued Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (ASU 2014-09), which replaced most existing revenue recognition guidance in U.S. GAAP. The core principle of the ASU is that an entity should recognize revenue for the transfer of goods or services equal to the amount that it expects to be entitled to receive for those goods or services. ASU 2014-09 requires additional disclosure about the nature, amount, timing, and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments. We adopted ASU 2014-09 on January 1, 2018, using the modified retrospective method of adoption. Adoption resulted in a $2.6 million, net of tax increase to retained earnings. This adjustment primarily relates to the deferral of costs to obtain a contract that were previously expensed at the beginning of the contract period.

In August 2016, the FASB issued Accounting Standards Update No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments (ASU 2016-15). The new guidance addresses how the following eight specific cash flow items are to be presented: Debt prepayment or debt extinguishment costs; settlement of zero-coupon debt instruments or other debt instruments with coupon interest rates that are insignificant in relation to the effective interest rate of the borrowing; contingent consideration payments made after a business combination; proceeds from the settlement of insurance claims; proceeds from the settlement of corporate-owned life insurance policies (including bank-owned life insurance policies); distributions received from equity method investees; beneficial interests in securitization transactions; and separately identifiable cash flows and application of the predominance principle. We adopted ASU 2016-15 on January 1, 2018. The adoption had no material impact on our statement of cash flows for the year ended December 31, 2018.

In October 2016, the FASB issued Accounting Standards Update No. 2016-16, Intra-Entity Transfers of Assets Other Than Inventory (ASU 2016-16), which requires recognition of the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. Consequently, the standard eliminates the exception to the recognition of current and deferred income taxes for an intra-entity asset transfer other than for inventory until the asset has been sold to an outside party. We adopted ASU 2016-16 on January 1, 2018. The adoption resulted in a $3.0 million and $46.9 million decrease to other current assets and other long-lived assets, respectively, as well as an $18.2 million increase in deferred income tax assets and a $31.7 million decrease to retained earnings on January 1, 2018. The adoption had no material impact on our results of operations.

In March 2017, the FASB issued ASU 2017-07, which requires an entity to report the service cost component in the same line item or items as other compensation costs arising from the service rendered by their employees during the period. The other components of net benefit cost are required to be presented in the Statement of Operations separately from the service cost component after Operating Income. Additionally, only the service cost component is eligible for capitalization, when applicable. The standard requires the amendments to be applied retrospectively for the presentation of the service cost component and the other cost components of net periodic pension cost and net periodic OPEB cost in the Statement of Operations and prospectively, on and after the effective date, for the capitalization of the service cost component of net periodic pension and OPEB costs. We adopted ASU 2017-07 on January 1, 2018, and elected to use the practical expedient related to the retrospective presentation requirements. Adoption resulted in a $0.7 million and $8.2 million increase to operating income for the years ended December 31, 2017 and 2016, respectively, but no changes to net income.

In January 2018, the FASB released guidance on the accounting for tax on the global intangible low-taxed income ("GILTI") provisions of the Tax Cuts and Jobs Act (the "Act"). The GILTI provisions impose a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. In the fourth quarter of 2018, the Company elected to treat any potential GILTI inclusions as a period cost.

In August 2018, the FASB issued ASU No. 2018-14 ("ASU 2018-14"), Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans. The amendments in ASU 2018-14 remove certain disclosures, clarify the specific requirements of disclosures, and add new disclosure requirements, including (1) the weighted-average interest crediting rates for cash balance plans and other plans with promised interest crediting rates and (2) an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The amendments are effective for fiscal years ending after December 15, 2020, and early adoption is permitted. We early adopted ASU 2018-14 in 2018. The adoption had no impact on our financial statements; only our disclosures. See Note 16.

Pending Adoption of Recent Accounting Pronouncements

In February 2016, the FASB issued Accounting Standards Update No. 2016-02, Leases (ASU 2016-02), a leasing standard for both lessees and lessors that supersedes the lease requirements in Accounting Standards Codification (ASC) Topic 840, "Leases." Under its core principle, a lessee will recognize a right-of-use asset and lease liability on the balance sheet for nearly all leased assets. Lessor accounting remains largely consistent with existing U.S. generally accepted accounting principles. We plan to adopt ASU 2016-02 on January 1, 2019 using the newly permitted transition method issued in July 2018, under ASU No. 2018-11 ("ASU 2018-11"), Leases: Targeted Improvements, which provides an additional (and optional) transition method for adopting the new lease standard. Under this transition method, an entity initially applies the new lease standard at the adoption date and recognizes a cumulative effect adjustment to opening retained earnings in the period of adoption. Furthermore, we plan to elect the following practical expedients and accounting policy elections upon adoption: (i) the package of practical expedients as defined in ASU 2016-02, (ii) the short-term lease accounting policy election, (iii) the practical expedient to not separate non-lease components from lease components, and (iv) the easement practical expedient, which permits an entity to continue applying its current policy for accounting for land easements that existed as of the effective date of ASU 2016-02. We are implementing changes to our systems and processes in response to the new standard. We expect the adoption will result in an increase to our total assets and liabilities on our consolidated balance sheet between $68 million and $78 million, before considering deferred taxes. The adoption is not expected to have a material impact on our results of operations.

In August 2017, the FASB issued Accounting Standards Update No. ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities. The new guidance better aligns an entity's risk management activities and financial reporting for hedging relationships through changes to both the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results. The new guidance also makes certain targeted improvements to simplify the application of hedge accounting guidance and ease the administrative burden of hedge documentation requirements and assessing hedge effectiveness. The standard is effective for fiscal years beginning after December 15, 2018, and early adoption is permitted. We do not expect the standard to have a material impact on our consolidated financial statements and related disclosures.

In February 2018, the FASB issued ASU No. 2018-02 (“ASU 2018-02”), Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income. ASU 2018-02 provides an option to allow reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act of 2017. The new guidance is effective for annual and interim periods beginning after December 15, 2018, and early adoption is permitted. We are currently evaluating the impact this update will have on our condensed consolidated financial statements and related disclosures.

In June 2018, the FASB issued ASU No. 2018-07 (“ASU 2018-07”), Improvements to Nonemployee Share-Based Payment Accounting. The amendments in ASU 2018-07 expand the scope of Topic 718, Compensation - Stock Compensation, to include share-based payment transactions for acquiring goods and services from non-employees, and provide that non-employee share-

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based payment awards be measured at their grant-date fair value and the probability of satisfying performance conditions be taken into account when non-employee share-based payment awards contain such conditions. The standard is effective for fiscal years beginning after December 15, 2018, and early adoption is permitted. We are currently evaluating the impact this update will have on our condensed consolidated financial statements and related disclosures.

In August 2018, the Securities and Exchange Commission (“SEC”) adopted the final rule under SEC Release No. 33-10532, Disclosure Update and Simplification, amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. Additionally, the amendments expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the amendments, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period presented. The amendments were effective on November 5, 2018, however, the SEC staff recently clarified in a Compliance and Disclosure Interpretation (C&DI) that it would not object if a registrant waits until it files Form 10-Q for the quarter that begins after the effective date to comply with the new requirements pertaining to the equity reconciliation but can adopt the other amendments upon effectiveness. We are in the process of evaluating the impact of the final rule on its consolidated financial statements.

Note 3: Revenues

On January 1, 2018, we adopted Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (Topic 606) using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period amounts are not adjusted and continue to be reported in accordance with the accounting standards in effect for those periods.

We recorded a net increase to retained earnings of $2.6 million as of January 1, 2018 due to the cumulative impact of adopting Topic 606, with the impact primarily related to sales commissions and software revenues within our Industrial Solutions segment. There was no significant impact to revenues for the year ended December 31, 2018 as a result of applying Topic 606.

Revenues are recognized when control of the promised goods or services is transferred to our customers and in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. Taxes collected from customers and remitted to governmental authorities are not included in our revenues. We do not evaluate a contract for a significant financing component when the time between cash collection and performance is less than one year. The following tables present our revenues disaggregated by major product category.

	Cable & Connectivity	Networking, Software & Security	Total Revenues
Year Ended December 31, 2018			
Enterprise Solutions	$ 1,046,744	$ 468,822	$ 1,515,566
Industrial Solutions	662,742	407,060	1,069,802
Total	$ 1,709,486	$ 875,882	$ 2,585,368
Year Ended December 31, 2017			
Enterprise Solutions	$ 1,024,090	$ 332,215	$ 1,356,305
Industrial Solutions	628,889	403,449	1,032,338
Total	$ 1,652,979	$ 735,664	$ 2,388,643
Year Ended December 31, 2016			
Enterprise Solutions	$ 1,003,799	$ 368,009	$ 1,371,808
Industrial Solutions	590,462	394,402	984,864

Total	$ 1,594,261	$ 762,411	$ 2,356,672

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The following tables present our revenues disaggregated by geography, based on the location of the customer purchasing the product.

	Americas	EMEA	APAC	Total Revenues
Year Ended December 31, 2018				
Enterprise Solutions	$981,822	$294,129	$239,615	$1,515,566
Industrial Solutions	619,721	290,607	159,474	1,069,802
Total	$1,601,543	$584,736	$399,089	$2,585,368
Year Ended December 31, 2017				
Enterprise Solutions	$925,647	$214,763	$215,895	$1,356,305
Industrial Solutions	606,331	280,890	145,117	1,032,338
Total	$1,531,978	$495,653	$361,012	$2,388,643
Year Ended December 31, 2016				
Enterprise Solutions	$937,741	$220,511	$213,556	$1,371,808
Industrial Solutions	596,032	261,055	127,777	984,864
Total	$1,533,773	$481,566	$341,333	$2,356,672

The following tables present our revenues disaggregated by products, including software products, and support and services.

	Products	Support & Services	Total Revenues
Year Ended December 31, 2018			
Enterprise Solutions	$1,441,757	$73,809	$ 1,515,566
Industrial Solutions	974,029	95,773	1,069,802
Total	$2,415,786	$169,582	$ 2,585,368
Year Ended December 31, 2017			
Enterprise Solutions	$1,281,960	$74,345	$ 1,356,305
Industrial Solutions	929,263	103,075	1,032,338
Total	$2,211,223	$177,420	$ 2,388,643
Year Ended December 31, 2016			
Enterprise Solutions	$1,293,392	$78,416	$ 1,371,808
Industrial Solutions	885,208	99,656	984,864
Total	$2,178,600	$178,072	$ 2,356,672

We generate revenues primarily by selling products that provide secure and reliable transmission of data, sound, and video for mission critical applications. We also generate revenues from providing support and professional services. We sell our products to distributors, end-users, installers, and directly to original equipment manufacturers. At times, we enter into arrangements that involve the delivery of multiple performance obligations. For these arrangements, revenue is allocated to each performance obligation based on its relative standalone selling price and recognized when or as each performance obligation is satisfied. Most of our performance obligations related to the sale of products are satisfied at a point in time when control of the product is transferred based on the shipping terms of the arrangement. Generally, we determine standalone selling price using the prices charged to customers on a standalone basis.

The amount of consideration we receive and revenue we recognize varies due to rebates, returns, and price adjustments. We estimate the expected rebates, returns, and price adjustments based on an analysis of historical experience, anticipated sales demand, and trends in product pricing. We adjust our estimate of revenue at the earlier of when the most likely amount of consideration we expect to receive changes or when the consideration becomes fixed. Adjustments to revenue for performance obligations satisfied in prior periods was not significant during the year ended December 31, 2018. Accrued rebates and accrued returns as of December 31, 2018 totaled $41.3 million and $11.9 million, respectively. Estimated price adjustments recognized against our gross accounts receivable balance as of December 31, 2018 totaled $25.1 million.

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Depending on the terms of an arrangement, we may defer the recognition of a portion of the consideration received because we have to satisfy a future obligation. Consideration allocated to support services under a support and maintenance contract is typically paid in advance and recognized ratably over the term of the service. Consideration allocated to professional services is recognized when or as the services are performed depending on the terms of the arrangement. As of January 1, 2018, total deferred revenue was $104.4 million, and during 2018, $202.1 million of revenue was deferred and $193.2 million of revenue was recognized. Thus, as of December 31, 2018, total deferred revenue was $113.3 million, and of this amount, $101.2 million will be recognized within the next twelve months, and the remaining $12.1 million is long-term and will be recognized over a period greater than twelve months.

We expense sales commissions as incurred when the duration of the related revenue arrangement is one year or less. We capitalize sales commissions in other current and long-lived assets on our balance sheet when the duration of the related revenue arrangement is longer than one year, and we amortize it over the related revenue arrangement period. Total capitalized sales commissions was $2.9 million as of December 31, 2018. Total sales commissions costs were $23.3 million during the year ended December 31, 2018. Sales commissions are recorded within selling, general and administrative expenses.

Note 4: Acquisitions

Net-Tech Technology, Inc.

We acquired 100% of the shares of NT2 on April 25, 2018 for a purchase price of $8.5 million that was funded with cash on hand. NT2 is an integrator of optical passive components and network optimization products used within broadband network applications where optical backhaul is used. NT2 is located in the United States. The results of NT2 have been included in our Consolidated Financial Statements from April 25, 2018, and are reported within the Enterprise Solutions segment. The NT2 acquisition was not material to our financial position or results of operations.

Snell Advanced Media

We acquired 100% of the outstanding ownership interest in SAM on February 8, 2018 for a purchase price, net of cash acquired, of $104.5 million. Of the $104.5 million purchase price, $75.2 million was paid on February 8, 2018 and was funded with cash on hand. The acquisition included a potential earnout, which was based upon future combined earnings of SAM and Grass Valley through December 31, 2019. The maximum earnout consideration is $31.4 million, but based upon a third party valuation specialist using certain assumptions in a discounted cash flow model, the preliminary estimated fair value of the earnout included in the purchase price was $29.3 million. We assumed debt of $19.3 million and paid it off during the first quarter of 2018. SAM designs, manufactures, and sells innovative content production and distribution systems for the broadcast and media markets. SAM is headquartered in the United Kingdom. The results of SAM have been included in our Consolidated Financial Statements from February 8, 2018, and are reported within the Enterprise Solutions segment. The following table summarizes the estimated, preliminary fair value of the assets acquired and the liabilities assumed as of February 8, 2018 (in thousands):

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Receivables	$16,551
Inventory	15,084
Prepaid and other current assets	3,799
Property, plant, and equipment	7,716
Intangible assets	51,000
Goodwill	102,715
Deferred income taxes	1,388
Other long-lived assets	3,046
Total assets acquired	$201,299
Accounts payable	$11,825
Accrued liabilities	24,405
Deferred revenue	8,860
Long-term debt	19,315
Postretirement benefits	31,774
Other long-term liabilities	591
Total liabilities assumed	$96,770
Net assets	$104,529

The above acquisition accounting is preliminary, and is subject to revision as additional information about the fair value of individual assets and liabilities becomes available. The preliminary measurement of receivables; inventories; property, plant and equipment; intangible assets; goodwill; deferred income taxes; deferred revenue; and other assets and liabilities are subject to change. A change in the estimated fair value of the net assets acquired will change the amount of the purchase price allocable to goodwill.

During the fourth quarter 2018, we recorded measurement-period adjustments that increased goodwill by approximately $15 million primarily for changes in the fair value of intangible assets and deferred revenue. The impact of these adjustments to the consolidated statement of operations was immaterial.

A single estimate of fair value results from a complex series of judgments about future events and uncertainties and relies heavily on estimates and assumptions. The judgments we have used in estimating the preliminary fair values assigned to each class of acquired assets and assumed liabilities could materially affect the results of our operations. The preliminary fair value of acquired receivables is $16.6 million, which is equivalent to its gross contractual amount.

For purposes of the above allocation, we based our estimates of the preliminary fair values for the acquired inventory; property, plant, and equipment; intangible assets; and deferred revenue on preliminary valuation studies performed by a third party valuation firm. We have estimated a preliminary fair value adjustment for inventories based on the estimated selling price of the work-in-process and finished goods acquired at the closing date less the sum of the costs to complete the work-in-process, the costs of disposal, and a reasonable profit allowance for our post acquisition selling efforts. To determine the value of the acquired property, plant, and equipment, we used various valuation methods, including both the market approach, which considers sales prices of similar assets in similar conditions (Level 2 valuation), and the cost approach, which considers the cost to replace the asset adjusted for depreciation (Level 3 valuation). We used various valuation methods including discounted cash flows, lost income, excess earnings, and relief from royalty to estimate the preliminary fair value of the identifiable intangible assets and deferred revenue (Level 3 valuation).

Goodwill and other intangible assets reflected above were determined to meet the criteria for recognition apart from tangible assets acquired and liabilities assumed. The goodwill is primarily attributable to expected synergies and the assembled workforce. The expected synergies for the SAM acquisition may be gained from cost synergies and helping broadcast and media content creators, aggregators and distributors significantly improve their effectiveness and efficiency during a period of rapid change in technology, viewer and advertiser behavior and business models. Our tax basis in the acquired goodwill is zero. The intangible assets related to the acquisition consisted of the following:

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	Preliminary Fair Value	Amortization Period
	(In thousands)	(In years)
Intangible assets subject to amortization:		
Developed technologies	$ 36,500	5.0
Customer relationships	11,000	12.0
Sales backlog	1,900	0.3
Trademarks	1,600	0.9
Total intangible assets subject to amortization	$ 51,000	
Intangible assets not subject to amortization:		
Goodwill	$ 102,715	n/a
Total intangible assets not subject to amortization	$ 102,715	
Total intangible assets	$ 153,715	
Weighted average amortization period		6.2 years

The amortizable intangible assets reflected in the table above were determined by us to have finite lives. The useful life for the developed technology intangible asset was based on the estimated time that the technology provides us with a competitive advantage and thus approximates the period and pattern of consumption of the intangible asset. The useful life for the customer relationship intangible asset was based on our forecasts of estimated sales from recurring customers. The useful life of the backlog intangible asset was based on our estimate of when the ordered items would ship. The useful life for the trademarks was based on the period of time we expect to continue to go to market using the trademarks.

Our consolidated revenues for the year ended December 31, 2018 included an estimated $106.3 million from SAM. Due to the integration of SAM into our existing business, we are unable to reasonably estimate the amount of income before taxes from SAM included in our consolidated financial statements. Our consolidated income before taxes for the year ended December 31, 2018 included $46.1 million of severance and other restructuring costs, $10.6 million of amortization of intangible assets, and $1.8 million of cost of sales related to the adjustment of acquired inventory to fair value from SAM.

The following table illustrates the unaudited pro forma effect on operating results as if the SAM acquisition had been completed as of January 1, 2017.

	Years Ended December 31,	
	2018	2017
	(In thousands, except per share data) (Unaudited)	
Revenues	$2,598,741	$2,500,779
Net income (loss) attributable to Belden common stockholders	168,819	(8,581)
Diluted income (loss) per share attributable to Belden common stockholders	$4.12	$(0.20)

For purposes of the pro forma disclosures, the year ended December 31, 2017 includes nonrecurring expenses related to the acquisition, including severance, restructuring, and acquisition integration costs; amortization of the sales backlog intangible asset; and cost of sales arising from the adjustment of inventory to fair value of $46.1 million, $1.9 million, and $1.7 million, respectively.

The above unaudited pro forma financial information is presented for informational purposes only and does not purport to represent what our results of operations would have been had we completed the acquisition on the date assumed, nor is it necessarily indicative of the results that may be expected in future periods. Pro forma adjustments exclude cost savings from any synergies resulting from the acquisition.

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Thinklogical Holdings, LLC

We acquired 100% of the outstanding ownership interest in Thinklogical on May 31, 2017 for cash of $165.8 million. Thinklogical designs, manufactures, and markets high-bandwidth fiber matrix switches, video, and keyboard/video/mouse extender solutions, camera extenders, and console management solutions. Thinklogical is headquartered in Connecticut. The results of Thinklogical have been included in our Consolidated Financial Statements from May 31, 2017, and are reported within the Enterprise Solutions segment. The following table summarizes the estimated fair values of the assets acquired and the liabilities assumed as of May 31, 2017 (in thousands):

Receivables	$4,355
Inventory	16,424
Prepaid and other current assets	320
Property, plant, and equipment	4,289
Intangible assets	73,400
Goodwill	70,654
Deferred income taxes	598
Total assets acquired	$170,040
Accounts payable	$1,231
Accrued liabilities	1,353
Deferred revenue	1,702
Total liabilities assumed	$4,286
Net assets	$165,754

A single estimate of fair value results from a complex series of judgments about future events and uncertainties and relies heavily on estimates and assumptions. The judgments we have used in estimating the fair values assigned to each class of acquired assets and assumed liabilities could materially affect the results of our operations.

The fair value of acquired receivables is $4.4 million, which is equivalent to its gross contractual amount.

For purposes of the above allocation, we based our estimate of the fair value for the acquired inventory, intangible assets, and deferred revenue on a valuation study performed by a third party valuation firm. We used various valuation methods including discounted cash flows, lost income, excess earnings, and relief from royalty to estimate the preliminary fair value of the identifiable intangible assets and deferred revenue (Level 3 valuation). The determination of the fair value of the assets acquired and liabilities assumed and the allocation of the purchase price is complete. Goodwill and other intangible assets reflected above were determined to meet the criterion for recognition apart from tangible assets acquired and liabilities assumed. The goodwill is primarily attributable to expected synergies and the assembled workforce. The expected synergies for the Thinklogical acquisition primarily consist of utilizing Belden's fiber and connectivity portfolio with Thinklogical's connections between matrix switch, control systems, transmitters and source to expand our product portfolio across our segments to both existing and new customers. Our tax basis in the acquired goodwill is approximately $43.3 million and is deductible for tax purposes over a period of 15 years up to the amount of the tax basis. The intangible assets related to the acquisition consisted of the following:

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	Fair Value (In thousands)	Amortization Period (In years)
Intangible assets subject to amortization:		
Developed technologies	$ 62,600	10.0
Customer relationships	6,500	8.0
Trademarks	2,900	10.0
Sales backlog	1,400	0.3
Total intangible assets subject to amortization	$ 73,400	
Intangible assets not subject to amortization:		
Goodwill	$ 70,654	n/a
Total intangible assets not subject to amortization	$ 70,654	
Total intangible assets	$ 144,054	
Weighted average amortization period		9.6 years

The amortizable intangible assets reflected in the table above were determined by us to have finite lives. The useful life for the customer relationship intangible asset was based on our forecasts of estimated sales from recurring customers. The useful life for the trademarks was based on the period of time we expect to continue to go to market using the trademarks. The useful life for the developed technology intangible asset was based on the estimated time that the technology provides us with a competitive advantage and thus approximates the period and pattern of consumption of the intangible asset. The useful life of the backlog intangible asset was based on our estimate of when the ordered items would ship.

Our consolidated revenues and consolidated income before taxes for the year ended December 31, 2017 included $30.8 million and $(8.9) million, respectively, from Thinklogical. The loss before taxes from Thinklogical included $11.9 million of amortization of intangible assets and $6.1 million of cost of sales related to the adjustment of acquired inventory to fair value.

The following table illustrates the unaudited pro forma effect on operating results as if the Thinklogical acquisition had been completed as of January 1, 2016.

	Years Ended December 31, 2017	2016
	(In thousands, except per share data) (Unaudited)	
Revenues	$2,399,715	$2,407,830
Net income attributable to Belden common stockholders	60,690	113,014
Diluted income per share attributable to Belden common stockholders	$1.42	$2.66

For purposes of the pro forma disclosures, the year ended December 31, 2016 includes nonrecurring expenses from the effects of purchase accounting, including cost of sales arising from the adjustment of inventory to fair value of $6.1 million and amortization of the sales backlog intangible asset of $1.4 million.

The above unaudited pro forma financial information is presented for informational purposes only and does not purport to represent what our results of operations would have been had we completed the acquisition on the date assumed, nor is it necessarily indicative of the results that may be expected in future periods. Pro forma adjustments exclude cost savings from any synergies resulting from the acquisition.

M2FX

We acquired 100% of the shares of M2FX on January 7, 2016 for a purchase price of $19.0 million. M2FX is a manufacturer of fiber optic cable and fiber protective solutions for broadband access and telecommunications networks. M2FX is located in the United Kingdom. The results of M2FX have been included in our Consolidated Financial Statements from January 7, 2016, and are reported within the Enterprise Solutions segment. The M2FX acquisition was not material to our financial position or results of operations. Of the total purchase price, $3.2 million was deferred as estimated earn-out consideration. We determined the estimated fair value of the earn-out with the assistance of a third party valuation specialist using a probability weighted discounted cash flow model. The estimated earn-out was scheduled to be paid in early 2017, however, the financial targets tied to the earn-out were not achieved. We reduced the earn-out liability to zero as of December 31, 2016 and recognized a $3.2 million benefit in Selling, General and Administrative expenses in the Consolidated Statements of Operations. This benefit was excluded from Segment EBITDA of our Enterprise Solutions segment.

Note 5: Operating Segments and Geographic Information

Effective January 1, 2018, we changed our organizational structure and, as a result, now are reporting two segments. The segments formerly known as Broadcast Solutions and Enterprise Solutions now are presented as the Enterprise Solutions segment, and the segments formerly known as Industrial Solutions and Network Solutions now are presented as the Industrial Solutions segment. The reorganization allows us to further accelerate progress in key strategic areas, and the segment consolidation properly aligns our external reporting with the way the businesses are now managed. We have recast the prior period segment information to conform to the change in the composition of these reportable segments. This change had no impact to our reporting units for purposes of goodwill impairment testing.

We have determined that each of the global business platforms represents a reportable segment.

The segments design, manufacture, and market a portfolio of signal transmission solutions for mission critical applications used in a variety of end markets, including broadcast, enterprise, and industrial. We sell the products manufactured by our segments principally through distributors or directly to systems integrators, original equipment manufacturers (OEMs), end-users, and installers.

The key measures of segment profit or loss reviewed by our chief operating decision maker are Segment Revenues and Segment EBITDA. Segment Revenues represent non-affiliate revenues and include revenues that would have otherwise been recorded by acquired businesses as independent entities but were not recognized in our Consolidated Statements of Operations due to the effects of purchase accounting and the associated write-down of acquired deferred revenue to fair value. Segment EBITDA excludes certain items, including depreciation expense; amortization of intangibles; asset impairment; severance, restructuring, and acquisition integration costs; purchase accounting effects related to acquisitions, such as the adjustment of acquired inventory and deferred revenue to fair value; and other costs. We allocate corporate expenses to the segments for purposes of measuring Segment EBITDA. Corporate expenses are allocated on the basis of each segment’s relative EBITDA prior to the allocation.

Our measure of segment assets does not include cash, goodwill, intangible assets, deferred tax assets, or corporate assets. All goodwill is allocated to reporting units of our segments for purposes of impairment testing.

The results of our former equity method investment in the Hirschmann JV, which we sold effective December 31, 2017, were not included in the corporate expense allocation.

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Operating Segment Information

Enterprise Solutions	Years ended December 31,		
	2018	2017	2016
	(In thousands)		
Segment revenues	$1,522,178	$1,356,305	$1,372,941
Affiliate revenues	6,085	5,091	2,799
Segment EBITDA	267,656	216,558	239,978
Depreciation expense	28,861	26,272	29,455
Amortization of intangibles	45,944	51,054	48,966
Amortization of software development intangible assets	2,180	56	—
Severance, restructuring, and acquisition integration costs	57,563	29,043	18,561
Purchase accounting effects of acquisitions	3,497	6,133	(2,079)
Deferred revenue adjustments	6,612	—	1,774
Patent settlement	—	—	(5,554)
Acquisition of property, plant and equipment	65,619	49,440	38,392
Segment assets	761,309	687,914	571,960

Industrial Solutions	Years ended December 31,		
	2018	2017	2016
	(In thousands)		
Segment revenues	$1,069,802	$1,032,338	$984,864
Affiliate revenues	81	67	71
Segment EBITDA	207,724	214,190	193,811
Depreciation expense	18,754	19,325	17,753
Amortization of intangibles	52,885	52,943	49,419
Amortization of software development intangible assets	8	—	—
Severance, restructuring, and acquisition integration costs	11,050	13,747	12,579
Deferred revenue adjustments	—	—	4,913
Acquisition of property, plant and equipment	29,215	13,319	15,190
Segment assets	458,801	458,481	342,038

Total Segments	Years ended December 31,		
	2018	2017	2016
	(In thousands)		
Segment revenues	$2,591,980	$2,388,643	$2,357,805
Affiliate revenues	6,166	5,158	2,870
Segment EBITDA	475,380	430,748	433,789
Depreciation expense	47,615	45,597	47,208
Amortization of intangibles	98,829	103,997	98,385
Amortization of software development intangible assets	2,188	56	—
Severance, restructuring, and acquisition integration costs	68,613	42,790	31,140
Purchase accounting effects of acquisitions	3,497	6,133	(2,079)
Deferred revenue adjustments	6,612	—	6,687
Patent settlement	—	—	(5,554)
Acquisition of property, plant and equipment	94,834	62,759	53,582
Segment assets	1,220,110	1,146,395	913,998

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The following table is a reconciliation of the total of the reportable segments' Revenues and EBITDA to consolidated revenues and consolidated income before taxes, respectively.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Total Segment Revenues	$2,591,980	$2,388,643	$2,357,805
Deferred revenue adjustments (1)	(6,612)	—	(6,687)
Patent settlement (2)	—	—	5,554
Consolidated Revenues	$2,585,368	$2,388,643	$2,356,672
Total Segment EBITDA	$475,380	$430,748	$433,789
Amortization of intangibles	(98,829)	(103,997)	(98,385)
Severance, restructuring, and acquisition integration costs (3)	(68,613)	(42,790)	(31,140)
Depreciation expense	(47,615)	(45,597)	(47,208)
Deferred revenue adjustments (1)	(6,612)	—	(6,687)
Purchase accounting effects related to acquisitions (4)	(3,497)	(6,133)	2,079
Costs related to patent litigation	(2,634)	—	—
Amortization of software development intangible assets	(2,188)	(56)	—
Loss on sale of assets (5)	(94)	(1,013)	—
Impairment of assets held for sale (5)	—	—	(23,931)
Patent settlement (2)	—	—	5,554
Income from equity method investment	—	7,502	1,793
Gain from patent litigation	62,141	—	—
Eliminations	(2,218)	(3,260)	(3,781)
Consolidated operating income	305,221	235,404	232,083
Interest expense, net	(61,559)	(82,901)	(95,050)
Non-operating pension cost	(342)	(714)	(8,230)
Loss on debt extinguishment	(22,990)	(52,441)	(2,342)
Consolidated income before taxes	$220,330	$99,348	$126,461

(1) Our segment results include revenues that would have been recorded by acquired businesses had they remained as independent entities. Our consolidated results do not include these revenues due to the purchase accounting effect of recording deferred revenue at fair value. See Note 4, Acquisitions, for details.

(2) Both our consolidated revenues and gross profit were positively impacted by royalty revenues received during 2016 that related to years prior to 2016 as a result of a patent settlement.

(3) See Note 12, Severance, Restructuring, and Acquisition Integration Activities, for details.

(4) In 2018, we recognized $3.5 million of cost of sales related to purchase accounting adjustments, most of which was for the adjustment of acquired inventory to fair value for our SAM and NT2 acquisitions. In 2017, we recognized $6.1 million of cost of sales related to the adjustment of acquired inventory to fair value for our Thinklogical acquisition. In 2016, we made a $3.2 million adjustment to reduce the earn-out liability associated with the M2FX acquisition. This adjustment was partially offset by $0.8 million and $0.2 million of cost of sales related to the adjustment of acquired inventory to fair value related to our Enterprise segment and M2FX acquisition, respectively.

(5) In 2018, 2017, and 2016, we recognized a $0.1 million loss on sale of assets, $1.0 million loss on sale of assets, and $23.9 million impairment of assets held for sale, respectively, for the sale of our MCS business and Hirschmann JV.

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Below are reconciliations of other segment measures to the consolidated totals.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Total segment assets	$1,220,110	$1,146,395	$913,998
Cash and cash equivalents	420,610	561,108	848,116
Goodwill	1,557,653	1,478,257	1,385,995
Intangible assets, less accumulated amortization	511,093	545,207	560,082
Deferred income taxes	56,018	42,549	33,706
Corporate assets	13,837	67,097	64,906
Total assets	$3,779,321	$3,840,613	$3,806,803
Total segment acquisition of property, plant and equipment	$94,834	$62,759	$53,582
Corporate acquisition of property, plant and equipment	3,013	1,502	392
Total acquisition of property, plant and equipment	$97,847	$64,261	$53,974

Geographic Information

The Company attributes foreign sales based on the location of the customer purchasing the product. The table below summarizes net sales and long-lived assets for the years ended December 31, 2018, 2017 and 2016 for the following countries: the U.S., Canada, China, and Germany. No other individual foreign country's net sales or long-lived assets are material to the Company.

	United States	Canada	China	Germany	All Other	Total
	(In thousands, except percentages)					
Year ended December 31, 2018						
Revenues	$1,324,653	$174,727	$132,544	$117,598	$835,846	$2,585,368
Percent of total revenues	51 %	7 %	5 %	5 %	32 %	100 %
Long-lived assets	$189,211	$32,312	$37,227	$39,870	$97,213	$395,833
Year ended December 31, 2017						
Revenues	$1,265,455	$167,605	$121,600	$113,990	$719,993	$2,388,643
Percent of total revenues	53 %	7 %	5 %	5 %	30 %	100 %
Long-lived assets	$231,938	$33,806	$34,774	$38,029	$63,982	$402,529
Year ended December 31, 2016						
Revenues	$1,283,925	$159,985	$114,605	$104,214	$693,943	$2,356,672
Percent of total revenues	55 %	7 %	5 %	4 %	29 %	100 %
Long-lived assets	$193,263	$31,278	$30,487	$32,386	$60,654	$348,068

Major Customer

Revenues generated from sales to the distributor Anixter International Inc., in both the Enterprise Solutions and Industrial Solutions segments, were $309.0 million (12% of revenues), $292.2 million (12% of revenues), and $286.2 million (12% of revenues) for 2018, 2017, and 2016, respectively. At December 31, 2018, we had $37.0 million in accounts receivable outstanding from Anixter International Inc. This represented approximately 8% of our total accounts receivable outstanding at December 31, 2018.

Note 6: Noncontrolling Interest

We have a 51% ownership percentage in a joint venture with Shanghai Hi-Tech Control System Co, Ltd (Hite). The purpose of the joint venture is to develop and provide certain Industrial Solutions products and integrated solutions to customers in China. Belden and Hite are committed to fund $1.53 million and $1.47 million, respectively, to the joint venture in the future. The joint venture is determined to not have sufficient equity at risk; therefore, it is considered a variable interest entity. We have determined that Belden is the primary beneficiary of the joint venture, due to both our ownership percentage and our control over the activities

of the joint venture that most significantly impact its economic performance based on the terms of the joint venture agreement with Hite. Because Belden is the primary beneficiary of the joint venture, we have consolidated the joint venture in our financial statements. The results of the joint venture attributable to Hite's ownership are presented as net loss attributable to noncontrolling interest in the consolidated statements of operations. The joint venture is not material to our consolidated financial statements as of or for the years ended December 31, 2018, 2017, or 2016.

Note 7: Income Per Share

The following table presents the basis of the income per share computation:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Numerator:			
Net income	$160,711	$92,853	$127,646
Less: Net loss attributable to noncontrolling interest	(183)	(357)	(357)
Less: Preferred stock dividends	34,931	34,931	15,428
Net income attributable to Belden common stockholders	$125,963	$58,279	$112,575
Denominator:			
Weighted average shares outstanding, basic	40,675	42,220	42,093
Effect of dilutive common stock equivalents	281	423	464
Weighted average shares outstanding, diluted	40,956	42,643	42,557

For the years ended December 31, 2018, 2017, and 2016, diluted weighted average shares outstanding do not include outstanding equity awards of 0.9 million, 0.5 million, and 0.6 million, respectively, because to do so would have been anti-dilutive. In addition, for the years ended December 31, 2018, 2017, and 2016, diluted weighted average shares outstanding do not include outstanding equity awards of 0.3 million, 0.2 million, and 0.1 million, respectively, because the related performance conditions have not been satisfied. Furthermore, for the years ended December 31, 2018, 2017, and 2016, diluted weighted average shares outstanding do not include the weighted average impact of preferred shares that are convertible into 6.9 million, 6.9 million, and 3.0 million common shares, respectively, because deducting the preferred stock dividends from net income was more dilutive.

For purposes of calculating basic earnings per share, unvested restricted stock units are not included in the calculation of basic weighted average shares outstanding until all necessary conditions have been satisfied and issuance of the shares underlying the restricted stock units is no longer contingent. Necessary conditions are not satisfied until the vesting date, at which time holders of our restricted stock units receive shares of our common stock.

For purposes of calculating diluted earnings per share, unvested restricted stock units are included to the extent that they are dilutive. In determining whether unvested restricted stock units are dilutive, each issuance of restricted stock units is considered separately.

Once a restricted stock unit has vested, it is included in the calculation of both basic and diluted weighted average shares outstanding.

Note 8: Inventories

The major classes of inventories were as follows:

	December 31,	
	2018	2017
	(In thousands)	
Raw materials	$146,803	$133,311
Work-in-process	45,939	35,807
Finished goods	152,572	153,377
Gross inventories	345,314	322,495
Excess and obsolete reserves	(28,896)	(25,269)
Net inventories	$316,418	$297,226

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Note 9: Property, Plant and Equipment

The carrying values of property, plant and equipment were as follows:

	December 31, 2018	December 31, 2017
	(In thousands)	
Land and land improvements	$30,173	$31,963
Buildings and leasehold improvements	141,009	148,598
Machinery and equipment	569,359	543,594
Computer equipment and software	139,773	136,509
Construction in process	64,145	46,898
Gross property, plant and equipment	944,459	907,562
Accumulated depreciation	(578,489)	(570,240)
Net property, plant and equipment	$365,970	$337,322

Depreciation Expense

We recognized depreciation expense of $47.6 million, $45.6 million, and $47.2 million in 2018, 2017, and 2016, respectively.

Note 10: Intangible Assets

The carrying values of intangible assets were as follows:

	December 31, 2018			December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
	(In thousands)			(In thousands)		
Goodwill	$1,557,653	$—	$1,557,653	$1,478,257	$—	$1,478,257
Definite-lived intangible assets subject to amortization:						
Developed technology	$545,982	$(379,896)	$166,086	$498,649	$(318,366)	$180,283
Customer relationships	331,643	(115,943)	215,700	320,550	(98,175)	222,375
Trademarks	57,860	(27,106)	30,754	56,794	(18,648)	38,146
In-service research and development	23,833	(16,471)	7,362	23,428	(13,483)	9,945
Backlog	15,885	(15,885)	—	14,535	(14,535)	—
Total intangible assets subject to amortization	975,203	(555,301)	419,902	913,956	(463,207)	450,749
Indefinite-lived intangible assets not subject to amortization:						
Trademarks	90,391	—	90,391	92,758	—	92,758
In-process research and development	800	—	800	1,700	—	1,700
Total intangible assets not subject to amortization	91,191	—	91,191	94,458	—	94,458
Intangible assets	$1,066,394	$(555,301)	$511,093	$1,008,414	$(463,207)	$545,207

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Segment Allocation of Goodwill and Trademarks

The changes in the carrying amount of goodwill assigned to reporting units in our reportable segments are as follows:

	Enterprise Solutions	Industrial Solutions	Consolidated
	(In thousands)		
Balance at December 31, 2016	$617,320	$768,675	$1,385,995
Acquisitions and purchase accounting adjustments	71,394	—	71,394
Translation impact	13,557	7,311	20,868
Balance at December 31, 2017	$702,271	$775,986	$1,478,257
Acquisitions and purchase accounting adjustments	105,899	—	105,899
Translation impact	(22,812)	(3,691)	(26,503)
Balance at December 31, 2018	$785,358	$772,295	$1,557,653

The changes in the carrying amount of indefinite-lived trademarks are as follows:

	Enterprise Solutions	Industrial Solutions	Consolidated
	(In thousands)		
Balance at December 31, 2016	$80,350	$41,622	$ 121,972
Translation impact	2,727	1,260	3,987
Reclassify to definite-lived	—	(33,201)	(33,201)
Balance at December 31, 2017	$83,077	$9,681	$ 92,758
Translation impact	(1,893)	(474)	(2,367)
Balance at December 31, 2018	$81,184	$9,207	$ 90,391

Impairment

The annual measurement date for our goodwill and indefinite-lived intangible assets impairment test is our fiscal November month-end. For our 2018 goodwill impairment test, we performed a quantitative assessment for four of our reporting units and determined the estimated fair values of our reporting units by calculating the present values of their estimated future cash flows using Level 3 inputs. We determined that the fair values of the reporting units were in excess of the carrying values; therefore, we did not record any goodwill impairment for the four reporting units. We performed a qualitative assessment for the remaining seven of our reporting units, and we determined that it was more likely than not that the fair value was greater than the carrying value. Therefore, we did not record any goodwill impairment for the seven reporting units. We also did not recognize any goodwill impairment in 2017 or 2016 based on the results of our annual goodwill impairment testing.

Similar to the quantitative goodwill impairment test, we determined the estimated fair values of our indefinite-lived trademarks by calculating the present values of the estimated cash flows (using Level 3 inputs) attributable to the respective trademarks. We did not recognize any trademark impairment charges in 2018, 2017, or 2016.

Amortization Expense

We recognized amortization expense in income from continuing operations of $101.0 million, $104.0 million, and $98.4 million in 2018, 2017, and 2016, respectively. We expect to recognize annual amortization expense of $90.4 million in 2019, $74.4 million in 2020, $42.1 million in 2021, $38.2 million in 2022, and $29.3 million in 2023 related to our intangible assets balance as of December 31, 2018.

The weighted-average amortization period for our customer relationships, trademarks, developed technology, and in-service research and development is 18.4 years, 7.9 years, 6.5 years, and 5.0 years, respectively.

In connection with a segment change in 2017, we re-evaluated the useful life of the Tripwire trademark and concluded that an indefinite life was no longer appropriate. We estimated a useful life of 10 years and will re-evaluate this estimate if and when our

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expected use of the Tripwire trademark changes. We began amortizing the Tripwire trademark in 2017, which resulted in amortization expense of $3.1 million for each of the years ended December 31, 2018 and 2017. As of December 31, 2018, the net book value of the Tripwire trademark was $24.8 million.

Note 11: Accrued Liabilities

The carrying values of accrued liabilities were as follows:

	December 31,	
	2018	2017
	(In thousands)	
Current deferred revenue	$101,194	$90,639
Wages, severance and related taxes	56,129	57,633
Accrued rebates	41,312	38,025
Employee benefits	25,670	25,406
Accrued interest	18,530	22,019
Other (individual items less than 5% of total current liabilities)	121,441	68,929
Accrued liabilities	$364,276	$302,651

Note 12: Severance, Restructuring, and Acquisition Integration Activities

Grass Valley and SAM Integration Program: 2018

During the first quarter of 2018, we began a restructuring program to integrate SAM with Grass Valley. The restructuring and integration activities are focused on achieving desired cost savings by consolidating existing and acquired facilities and other support functions. We recognized $42.3 million of severance and other restructuring costs for this program during 2018. The costs were incurred by the Enterprise Solutions segment. We expect to incur approximately $3 million of additional severance and restructuring costs for this program, which will be incurred during the first quarter of 2019.

Industrial Manufacturing Footprint Program: 2016-2018

In 2016, we began a program to consolidate our manufacturing footprint. The manufacturing consolidation is complete. We recognized $17.7 million, $30.6 million, and $17.8 million of severance and other restructuring costs for this program during 2018, 2017, and 2016, respectively. The costs were incurred by the Enterprise Solutions and Industrial Solutions segments, as the manufacturing locations involved in the program serve both platforms. To date, we have incurred a total of $66.1 million in severance and other restructuring costs, including manufacturing inefficiencies for this program.

The following tables summarize the costs by segment of the various programs described above as well as other immaterial programs and acquisition integration activities:

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	Severance	Other Restructuring and Integration Costs	Total Costs
		(In thousands)	
Year Ended December 31, 2018			
Enterprise Solutions	$ 9,945	$ 47,618	$ 57,563
Industrial Solutions	378	10,672	11,050
Total	$ 10,323	$ 58,290	$ 68,613
Year Ended December 31, 2017			
Enterprise Solutions	$ 4,535	$ 24,508	$ 29,043
Industrial Solutions	676	13,071	13,747
Total	$ 5,211	$ 37,579	$ 42,790
Year Ended December 31, 2016			
Enterprise Solutions	$ 520	$ 18,041	$ 18,561
Industrial Solutions	6,562	6,017	12,579
Total	$ 7,082	$ 24,058	$ 31,140

The other restructuring and integration costs primarily consisted of equipment transfers, costs to consolidate operating and support facilities, retention bonuses, relocation, travel, legal, and other costs. The majority of the other restructuring and integration costs related to these actions were paid as incurred or are payable within the next 60 days.

Of the total severance, restructuring, and acquisition integration costs recognized during 2018, $28.1 million, $35.0 million, and $5.5 million were included in cost of sales; selling, general and administrative expenses; and research and development expenses, respectively. Of the total severance, restructuring, and acquisition integration costs recognized during 2017, $32.6 million, $10.0 million, and $0.2 million were included in cost of sales; selling, general and administrative expenses; and research and development expenses, respectively. Of the total severance and other restructuring costs recognized during 2016, $12.3 million, $18.0 million, and $0.8 million were included in cost of sales; selling, general and administrative expenses; and research and development expenses, respectively.

There were no significant severance accrual balances as of December 31, 2018 or 2017.

Note 13: Long-Term Debt and Other Borrowing Arrangements

The carrying values of our long-term debt and other borrowing arrangements were as follows:

	December 31, 2018	2017
	(In thousands)	
Revolving credit agreement due 2022	$—	$—
Senior subordinated notes:		
3.875% Senior subordinated notes due 2028	400,050	—
3.375% Senior subordinated notes due 2027	514,350	540,810
4.125% Senior subordinated notes due 2026	228,600	240,360
2.875% Senior subordinated notes due 2025	342,900	360,540
5.25% Senior subordinated notes due 2024	—	200,000
5.50% Senior subordinated notes due 2023	—	242,522
Total senior subordinated notes	1,485,900	1,584,232
Less unamortized debt issuance costs	(22,700)	(23,484)
Long-term debt	$1,463,200	$1,560,748

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Revolving Credit Agreement due 2022

In 2017, we entered into an Amended and Restated Credit Agreement (the Revolver) to amend and restate our prior Revolving Credit Agreement. The Revolver provides a $400.0 million multi-currency asset-based revolving credit facility. The borrowing base under the Revolver includes eligible accounts receivable; inventory; and property, plant and equipment of certain of our subsidiaries in the U.S., Canada, Germany, and the Netherlands. The maturity date of the Revolver is May 16, 2022. Interest on outstanding borrowings is variable, based upon LIBOR or other similar indices in foreign jurisdictions, plus a spread that ranges from 1.25%-1.75%, depending upon our leverage position. We pay a commitment fee on our available borrowing capacity of 0.25%. In the event we borrow more than 90% of our borrowing base, we are subject to a fixed charge coverage ratio covenant. In 2017, we recognized a $0.8 million loss on debt extinguishment for unamortized debt issuance costs related to creditors no longer participating in the new Revolver. In connection with executing the Revolver, we also paid $2.3 million of fees to creditors and third parties that we will amortize over the remaining term of the Revolver. As of December 31, 2018, we had no borrowings outstanding on the Revolver, and our available borrowing capacity was $359.1 million.

Senior Subordinated Notes

In March 2018, we completed an offering for €350.0 million ($431.3 million at issuance) aggregate principal amount of 3.875% senior subordinated notes due 2028 (the 2028 Notes). The carrying value of the 2028 Notes as of December 31, 2018 is $400.1 million. The 2028 Notes are guaranteed on a senior subordinated basis by our current and future domestic subsidiaries. The 2028 Notes rank equal in right of payment with our senior subordinated notes due 2027, 2026, and 2025 and with any future subordinated debt, and they are subordinated to all of our senior debt and the senior debt of our subsidiary guarantors, including our Revolver. Interest is payable semiannually on March 15 and September 15 of each year, which commenced on September 15, 2018. We paid approximately $7.5 million of fees associated with the issuance of the 2028 Notes, which are being amortized over the life of the 2028 Notes using the effective interest method. We used the net proceeds from this offering and cash on hand to repurchase the 2023 and 2024 Notes - see further discussion below.

In July 2017, we completed an offering for €450.0 million ($509.5 million at issuance) aggregate principal amount of 3.375% senior subordinated notes due 2027 (the 2027 Notes). The carrying value of the 2027 Notes as of December 31, 2018 is $514.4 million. The 2027 Notes are guaranteed on a senior subordinated basis by our current and future domestic subsidiaries. The 2027 Notes rank equal in right of payment with our senior subordinated notes due 2028, 2026, and 2025 and with any future subordinated debt, and they are subordinated to all of our senior debt and the senior debt of our subsidiary guarantors, including our Revolver. Interest is payable semiannually on January 15 and July 15 of each year, which commenced on January 15, 2018. We paid approximately $8.8 million of fees associated with the issuance of the 2027 Notes, which are being amortized over the life of the 2027 Notes using the effective interest method.

In October 2016, we completed an offering for €200.0 million ($222.2 million at issuance) aggregate principal amount of 4.125% senior subordinated notes due 2026 (the 2026 Notes). The carrying value of the 2026 Notes as of December 31, 2018 is $228.6 million. The 2026 Notes are guaranteed on a senior subordinated basis by our current and future domestic subsidiaries. The notes rank equal in right of payment with our senior subordinated notes due 2028, 2027, and 2025 and with any future subordinated debt, and they are subordinated to all of our senior debt and the senior debt of our subsidiary guarantors, including our Revolver. Interest is payable semiannually on April 15 and October 15 of each year, which commenced on April 15, 2017. We paid approximately $3.9 million of fees associated with the issuance of the 2026 Notes, which are being amortized over the life of the 2026 Notes using the effective interest method.

In September 2017, we completed an offering for €300.0 million ($357.2 million at issuance) aggregate principal amount of 2.875% senior subordinated notes due 2025 (the 2025 Notes). The carrying value of the 2025 Notes as of December 31, 2018 is $342.9 million. The 2025 Notes are guaranteed on a senior subordinated basis by our current and future domestic subsidiaries. The 2025 Notes rank equal in right of payment with our senior subordinated notes due 2028, 2027, and 2026 and with any future subordinated debt, and they are subordinated to all of our senior debt and the senior debt of our subsidiary guarantors, including our Revolver. Interest is payable semiannually on March 15 and September 15 of each year, which commenced on March 15, 2018. We paid approximately $6.2 million of fees

associated with the issuance of the 2025 Notes, which are being amortized over the life of the 2025 Notes using the effective interest method.
We had outstanding $200 million aggregate principal amount of 5.25% senior subordinated notes due 2024 (the 2024 Notes). In March 2018, we repurchased $188.7 million of the 2024 Notes outstanding for cash consideration of $199.8 million, including a prepayment penalty and recognized a $13.8 million loss on debt extinguishment including the write-off of unamortized debt issuance costs. In April 2018, we repurchased the remaining 2024 Notes outstanding for cash consideration of $11.9 million, including a prepayment penalty, and recognized a $0.8 million loss on debt extinguishment including the write-off of unamortized debt issuance costs.

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We had outstanding €200.0 million aggregate principal amount of 5.5% senior subordinated notes due 2023 (the 2023 Notes). In March 2018, we repurchased €143.1 million of the €200.0 million 2023 Notes outstanding for cash consideration of €147.8 million ($182.1 million), including a prepayment penalty and recognized a $6.2 million loss on debt extinguishment including the write-off of unamortized debt issuance costs. In April 2018, we repurchased the remaining 2023 Notes outstanding for cash consideration of €58.5 million ($71.6 million), including a prepayment penalty, and recognized a $2.2 million loss on debt extinguishment including the write-off of unamortized debt issuance costs.

The senior subordinated notes due 2025, 2026, 2027 and 2028 are redeemable after September 15, 2020, October 15, 2021, July 15, 2022, and March 15, 2023, respectively, at the following redemption prices as a percentage of the face amount of the notes:

Senior Subordinated Notes due							
2025		2026		2027		2028	
Year	Percentage	Year	Percentage	Year	Percentage	Year	Percentage
2020	101.438 %	2021	102.063 %	2022	101.688 %	2023	101.9375 %
2021	100.719 %	2022	101.375 %	2023	101.125 %	2024	101.2916 %
2022 and thereafter	100.000 %	2023	100.688 %	2024	100.563 %	2025	100.6458 %
		2024 and thereafter	100.000 %	2025 and thereafter	100.000 %	2026 and thereafter	100.0000 %

Fair Value of Long-Term Debt

The fair value of our senior subordinated notes as of December 31, 2018 was approximately $1,485.0 million based on quoted prices of the debt instruments in inactive markets (Level 2 valuation). This amount represents the fair values of our senior subordinated notes with a carrying value of $1,485.9 million as of December 31, 2018.

Maturities

Maturities on outstanding long-term debt and other borrowings during each of the five years subsequent to December 31, 2018 are as follows (in thousands):

2019	$—
2020	—
2021	—
2022	—
2023	—
Thereafter	1,485,900
	$1,485,900

Note 14: Net Investment Hedge

All of our euro denominated notes were issued by Belden Inc., a USD functional currency entity. As of December 31, 2018, all of our outstanding foreign denominated debt is designated as a net investment hedge on the foreign currency risk of our net investment in our euro foreign operations. The objective of the hedge is to protect the net investment in the foreign operations against adverse changes in the euro exchange rate. The transaction gain or loss is reported in the cumulative translation adjustment section of other comprehensive income. The amount of the cumulative translation adjustment associated with these notes at December 31, 2018 and 2017 was a gain of $87.5 million and a loss of $56.2 million, respectively.

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Note 15: Income Taxes

	Years ended December 31,		
	2018	2017	2016
		(In thousands)	
Income (loss) before taxes:			
United States operations	$126,385	$ 2,177	$(25,615)
Foreign operations	93,945	97,171	152,076
Income before taxes	$220,330	$ 99,348	$126,461
Income tax expense (benefit):			
Currently payable			
United States federal	$27,529	$ —	$2,981
United States state and local	3,274	2,392	(1,038)
Foreign	17,516	28,201	26,906
	48,319	30,593	28,849
Deferred			
United States federal	10,942	(11,028)	(27,677)
United States state and local	703	(8,758)	(3,139)
Foreign	(345)	(4,312)	782
	11,300	(24,098)	(30,034)
Income tax expense (benefit)	$59,619	$ 6,495	$(1,185)

	Years Ended December 31,		
	2018	2017	2016
Effective income tax rate reconciliation from continuing operations:			
United States federal statutory rate	21.0 %	35.0 %	35.0 %
State and local income taxes	1.7 %	0.8 %	(0.9)%
Impact of change in tax contingencies	(1.0)%	2.2 %	2.4 %
Foreign income tax rate differences	(1.8)%	(13.1)%	(14.0)%
Impact of change in deferred tax asset valuation allowance	2.0 %	1.5 %	(7.3)%
Impact of change in legal entity tax status	— %	— %	(5.5)%
Impact of non-taxable translation gain	— %	(27.3)%	— %
Impact of non-taxable interest income	— %	(5.5)%	(4.9)%
Domestic permanent differences and tax credits	0.7 %	(15.7)%	(5.7)%
Impact of tax reform	4.5 %	28.6 %	— %
	27.1 %	6.5 %	(0.9)%

On December 22, 2017, the “Tax Cuts and Jobs Act” (the “Act”) was signed into law, making significant changes to the U.S. Internal Revenue Code. Changes include, but are not limited to, a corporate tax rate decrease from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial tax system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. In accordance with the Act, we recorded $28.4 million as an additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. The total income tax expense included a $36.0 million tax benefit for the remeasurement of deferred tax assets and liabilities to the 21% rate at which they are expected to reverse, offset with a one-time tax expense on deemed repatriation of $29.1 million and a valuation allowance of $35.3 million recorded against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law. Additionally, Staff Accounting Bulletin No. 118 (“SAB 118”) was issued to address the application of US GAAP 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 Act. December 22, 2018 marked the end of the measurement period for purposes of SAB 118. As such, we have completed our analysis based on legislative updates relating to the Act currently available which resulted in an additional SAB 118 tax expense of $2.9 million in the fourth quarter of 2018 and a total tax expense of $10.0 million for the year ended

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December 31, 2018. The total tax provision expense included an $8.0 million tax expense associated with an increase to the valuation allowance against foreign tax credit carryovers that we no longer expect to be able to realize based upon the new tax law, a $1.3 million tax expense adjustment to the transition tax on the deemed repatriation of cumulative foreign earnings, a $1.1 million tax expense resulting from a valuation allowance established on the deferred tax assets associated with stock options of covered employees, and a $0.4 million income tax benefit associated with an adjustment to the remeasurement of certain deferred tax assets and liabilities.

If we were to repatriate foreign cash to the U.S., we may be required to accrue and pay U.S. taxes in accordance with applicable U.S. tax rules and regulations as a result of the repatriation. However, it is our practice and intention to reinvest the earnings of our non-U.S. subsidiaries in those operations. As a result, as of December 31, 2018, we have not made a provision for U.S. or additional foreign withholding taxes.

Foreign tax rate differences resulted in an income tax benefit of $4.0 million, $13.0 million, and $17.7 million in 2018, 2017, and 2016, respectively. Additionally, in 2018 and 2017, our income tax expense was reduced by $3.0 million and $3.5 million, respectively, due to a tax holiday for our operations in St. Kitts. The tax holiday in St. Kitts is scheduled to expire in 2022.

	December 31,	
	2018	2017
	(In thousands)	
Components of deferred income tax balances:		
Deferred income tax liabilities:		
Plant, equipment, and intangibles	$(114,413)	$(120,171)
Deferred income tax assets:		
Postretirement, pensions, and stock compensation	30,896	28,736
Reserves and accruals	25,641	29,297
Net operating loss and tax credit carryforwards	164,823	228,815
Valuation allowances	(90,872)	(151,841)
	130,488	135,007
Net deferred income tax asset	$16,075	$14,836

The decrease in deferred income tax liabilities associated with plant, equipment and intangibles during 2018 is primarily due to the adoption of ASU 2016-16 in the first quarter of 2018 in which deferred tax assets associated with prior intercompany sales of intangible assets were recorded onto the Company's balance sheet. The decrease in our net operating loss carryforwards and deferred tax valuation allowances is primarily due to the write-off of certain foreign net operating loss carryforwards and the corresponding valuation allowance associated with those foreign net operating losses. The Company has determined these net operating losses are not realizable as a result of a significant change in business operations that occurred in a prior year.

As of December 31, 2018, we had $537.3 million of gross net operating loss carryforwards and $71.0 million of tax credit carryforwards. Unless otherwise utilized, net operating loss carryforwards will expire upon the filing of the tax returns for the following respective years: $0.2 million in 2018, $8.0 million in 2019, $29.4 million between 2020 and 2022, and $167.8 million between 2023 and 2038. Net operating losses with an indefinite carryforward period total $331.9 million. Of the $537.3 million in net operating loss carryforwards, we have determined, based on the weight of all available evidence, both positive and negative, that we will utilize $172.5 million of these net operating loss carryforwards within their respective expiration periods. A valuation allowance has been recorded on the remaining portion of the net operating loss carryforwards.

Unless otherwise utilized, tax credit carryforwards of $71.0 million will expire as follows: $1.6 million between 2020 and 2022, $64.2 million between 2023 and 2038. Tax credit carryforwards with an indefinite carryforward period total $5.2 million. We have determined, based on the weight of all available evidence, both positive and negative, that we will utilize $42.7 million of these tax credit carryforwards within their respective expiration periods. A valuation allowance has been recorded on the remaining portion of the tax credit carryforwards.

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The following tables summarize our net operating loss carryforwards and tax credit carryforwards as of December 31, 2018 by jurisdiction:

	Net Operating Loss Carryforwards
	(In thousands)
Australia	$ 12,064
France	15,538
Germany	13,436
Japan	20,203
Luxembourg	24,252
Netherlands	23,889
Other	45,171
United Kingdom	258,423
United States - Federal and various states	124,349
Total	$ 537,325

	Tax Credit Carryforwards
	(In thousands)
United States	$ 48,859
Canada	22,181
Total	$ 71,040

In 2018, we recognized a net $1.2 million decrease to reserves for uncertain tax positions. A reconciliation of the beginning and ending amounts of unrecognized tax benefits is as follows:

	2018	2017
	(In thousands)	
Balance at beginning of year	$8,579	$10,474
Additions based on tax positions related to the current year	866	981
Additions for tax positions of prior years	1,292	2,549
Reductions for tax positions of prior years - Settlement	(1,689)	(5,425)
Reduction for tax positions of prior years - Statute of limitations	(1,631)	—
Balance at end of year	$7,417	$8,579

The additions for tax positions of prior years relates to transition tax. The balance of $7.4 million at December 31, 2018, reflects tax positions that, if recognized, would impact our effective tax rate.

As of December 31, 2018, we believe it is reasonably possible that $0.9 million of unrecognized tax benefits will change within the next twelve months primarily attributable to the expected completion of tax audits in the U.S. and foreign jurisdictions.

Our practice is to recognize interest and penalties related to uncertain tax positions in interest expense and operating expenses, respectively. During 2016, we recognized reductions of interest expense of $0.2 million related to uncertain tax positions. We do not have any material amounts accrued for the payment of interest and penalties as of December 31, 2018 and 2017.

Our federal tax return for the tax years 2015 and later remain subject to examination by the Internal Revenue Service. Belden reached agreement with the Internal Revenue Service for the 2013 and 2014 tax years in December 2018. Our state and foreign income tax returns for the tax years 2010 and later remain subject to examination by various state and foreign tax authorities.

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Note 16: Pension and Other Postretirement Benefits

We sponsor defined benefit pension plans and defined contribution plans that cover substantially all employees in Canada, the Netherlands, the United Kingdom, the U.S., and certain employees in Germany and Japan. Our plans in the United Kingdom include SAM's defined contribution and defined benefit plans which we acquired during 2018 (see Note 4). The SAM defined benefit plans are frozen and additional benefits are not being earned by the participants. We closed the U.S. defined benefit pension plan to new entrants effective January 1, 2010. Employees who were not active participants in the U.S. defined benefit pension plan on December 31, 2009, are not eligible to participate in the plan. During 2017, we sold our MCS business and its associated pension liabilities. Annual contributions to retirement plans equal or exceed the minimum funding requirements of applicable local regulations. The assets of the funded pension plans we sponsor are maintained in various trusts and are invested primarily in equity and fixed income securities.

Benefits provided to employees under defined contribution plans include cash contributions by the Company based on either hours worked by the employee or a percentage of the employee's compensation. Defined contribution expense for 2018, 2017, and 2016 was $15.2 million, $13.9 million, and $13.5 million, respectively.

We sponsor unfunded postretirement medical and life insurance benefit plans for certain of our employees in Canada and the U.S. The medical benefit portion of the U.S. plan is only for employees who retired prior to 1989 as well as certain other employees who were near retirement and elected to receive certain benefits.

The following tables provide a reconciliation of the changes in the plans' benefit obligations and fair value of assets as well as a statement of the funded status and balance sheet reporting for these plans.

	Pension Benefits		Other Benefits	
Years Ended December 31,	2018	2017	2018	2017
		(In thousands)		
Change in benefit obligation:				
Benefit obligation, beginning of year	$(272,025)	$(256,481)	$(30,333)	$(32,038)
Service cost	(4,705)	(4,978)	(47)	(49)
Interest cost	(11,690)	(7,671)	(945)	(1,139)
Participant contributions	(85)	(91)	(6)	(7)
Actuarial gain (loss)	15,032	(3,291)	1,681	3,370
Divestitures (acquisitions)	(185,692)	794	—	—
Settlements	7,437	49	—	—
Plan amendments	(2,822)	—	—	—
Foreign currency exchange rate changes	23,454	(14,299)	2,020	(2,022)
Benefits paid	12,849	13,943	1,487	1,552
Benefit obligation, end of year	$(418,247)	$(272,025)	$(26,143)	$(30,333)

	Pension Benefits		Other Benefits	
Years Ended December 31,	2018	2017	2018	2017
		(In thousands)		
Change in plan assets:				
Fair value of plan assets, beginning of year	$198,156	$182,370	$ —	$ —
Actual return on plan assets	(8,364)	18,746	—	—
Employer contributions	5,397	4,425	1,481	1,545
Plan participant contributions	85	91	6	7
Acquisitions	153,919	—	—	—
Settlements	(7,054)	—	—	—
Foreign currency exchange rate changes	(17,616)	6,467	—	—
Benefits paid	(12,849)	(13,943)	(1,487)	(1,552)
Fair value of plan assets, end of year	$311,674	$198,156	$ —	$ —

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Funded status, end of year	$(106,573)	$(73,869)	$(26,143)	$(30,333)
Amounts recognized in the balance sheets:				
Prepaid benefit cost	$4,801	$3,174	$—	$—
Accrued benefit liability (current)	(3,320)	(3,736)	(1,405)	(1,555)
Accrued benefit liability (noncurrent)	(108,054)	(73,307)	(24,738)	(28,778)
Net funded status	$(106,573)	$(73,869)	$(26,143)	$(30,333)

The accumulated benefit obligation for all defined benefit pension plans was $412.4 million and $269.2 million at December 31, 2018 and 2017, respectively.

The projected benefit obligation, accumulated benefit obligation, and fair value of plan assets for the pension plans with a projected benefit obligation in excess of plan assets were $368.5 million, $362.6 million, and $257.1 million, respectively, as of December 31, 2018 and were $215.6 million, $212.7 million, and $138.5 million, respectively, as of December 31, 2017.

The accumulated benefit obligation and fair value of plan assets for other postretirement benefit plans with an accumulated benefit obligation in excess of plan assets were $26.1 million and $0.0 million, respectively, as of December 31, 2018 and were $30.3 million and $0.0 million, respectively, as of December 31, 2017.

The following table provides the components of net periodic benefit costs for the plans.

	Pension Benefits			Other Benefits		
Years Ended December 31,	2018	2017	2016	2018	2017	2016
			(In thousands)			
Components of net periodic benefit cost:						
Service cost	$4,705	$4,978	$4,981	$47	$49	$46
Interest cost	11,690	7,671	8,909	945	1,139	1,259
Expected return on plan assets	(16,391)	(10,644)	(12,013)	—	—	—
Amortization of prior service credit	(42)	(41)	(42)	—	—	(42)
Curtailment gain	—	—	(227)	—	—	—
Settlement loss (gain)	1,342	(8)	7,630	—	—	—
Net loss (gain) recognition	2,810	2,597	2,670	(12)	—	86
Net periodic benefit cost	$4,114	$4,553	$11,908	$980	$1,188	$1,349

We recorded settlement losses totaling $1.3 million and $7.6 million during 2018 and 2016, respectively. These settlement losses were the result of lump-sum payments to participants that exceeded the sum of the pension plan's respective annual service cost and interest cost amounts.

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The following table presents the assumptions used in determining the benefit obligations and the net periodic benefit cost amounts.

	Pension Benefits		Other Benefits	
Years Ended December 31,	2018	2017	2018	2017
Weighted average assumptions for benefit obligations at year end:				
Discount rate	3.1 %	2.8 %	3.7 %	3.3 %
Salary increase	3.6 %	3.6 %	N/A	N/A
Cash balance interest credit rate	4.7 %	4.7 %	N/A	N/A
Weighted average assumptions for net periodic cost for the year:				
Discount rate	2.8 %	3.1 %	3.3 %	3.7 %
Salary increase	3.6 %	3.6 %	N/A	N/A
Cash balance interest credit rate	4.7 %	4.7 %	N/A	N/A
Expected return on assets	5.5 %	6.0 %	N/A	N/A
Assumed health care cost trend rates:				
Health care cost trend rate assumed for next year	N/A	N/A	5.8 %	6.2 %
Rate that the cost trend rate gradually declines to	N/A	N/A	5.0 %	5.0 %
Year that the rate reaches the rate it is assumed to remain at	N/A	N/A	2025	2024

Plan assets are invested using a total return investment approach whereby a mix of equity securities and fixed income securities are used to preserve asset values, diversify risk, and achieve our target investment return benchmark. Investment strategies and asset allocations are based on consideration of the plan liabilities, the plan’s funded status, and our financial condition. Investment performance and asset allocation are measured and monitored on an ongoing basis.

Plan assets are managed in a balanced portfolio comprised of two major components: an asset growth portion and an asset protection portion. The expected role of asset growth investments is to maximize the long-term real growth of assets, while the role of asset protection investments is to generate current income, provide for more stable periodic returns, and provide some protection against a permanent loss of capital.

Absent regulatory or statutory limitations, the target asset allocation for the investment of the assets for our ongoing pension plans is 30-40% in asset protection investments and 60-70% in asset growth investments and for our pension plans where the majority of the participants are in payment or terminated vested status is 55-90% in asset protection investments and 10-45% in asset growth investments. Asset growth investments include a diversified mix of U.S. and international equity, primarily invested through investment funds. Asset protection investments include government securities and investment grade corporate bonds, primarily invested through investment funds and group insurance contracts. We develop our expected long-term rate of return assumptions based on the historical rates of returns for securities and instruments of the type in which our plans invest.

The expected long-term rate of return on plan assets reflects the average rate of earnings expected on the invested assets and future assets to be invested to provide for the benefits included in the projected benefit obligation. We use historic plan asset returns combined with current market conditions to estimate the rate of return. The expected rate of return on plan assets is a long-term assumption based on an analysis of historical and forward looking returns considering the plan’s actual and target asset mix.

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The following table presents the fair values of the pension plan assets by asset category.

	December 31, 2018				December 31, 2017			
	Fair Market Value at December 31, 2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Fair Market Value at December 31, 2017	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	(In thousands)				(In thousands)			
Asset Category:								
Equity securities(a)								
U.S. equities fund	$96,417	$ 1,465	$ —	$ —	$95,425	$ —	$ —	$ —
Non-U.S. equities fund	47,274	5,755	—	—	11,571	—	—	—
Debt securities(b)								
Government bond fund	66,439	—	1,253	—	28,429	—	—	—
Corporate bond fund	39,366	—	7,116	—	24,421	—	—	—
Fixed income fund(c)	41,167	—	39,340	—	38,072	—	38,072	—
Other investments(d)	17,274	—	—	—	—	—	—	—
Cash & equivalents	3,737	301	—	—	238	238	—	—
Total	$311,674	$ 7,521	$ 47,709	$ —	$198,156	$ 238	$ 38,072	$ —

(a) This category includes investments in actively managed and indexed investment funds that invest in a diversified pool of equity securities of companies located in the U.S., Canada, Western Europe and other developed countries throughout the world. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund. Equity securities held in separate accounts are valued based on observable quoted prices on active exchanges. Funds which are valued using the net asset value method are not included in the fair value hierarchy.

(b) This category includes investments in investment funds that invest in U.S. treasuries; other national, state and local government bonds; and corporate bonds of highly rated companies from diversified industries. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund. Funds valued using the net asset value method are not included in the fair value hierarchy.

(c) This category includes guaranteed insurance contracts and annuity policies.

(d) This category includes investments in hedge funds that pursue multiple strategies in order to provide diversification and balance risk/return objectives, real estate funds, and private equity funds. Funds valued using the net asset method are not included in the fair value hierarchy.

The plans do not invest in individual securities. All investments are through well diversified investment funds. As a result, there are no significant concentrations of risk within the plan assets.

The following table reflects the benefits as of December 31, 2018 expected to be paid in each of the next five years and in the aggregate for the five years thereafter from our pension and other postretirement plans. Because our other postretirement plans are unfunded, the anticipated benefits with respect to these plans will come from our own assets. Because our pension plans are primarily funded plans, the anticipated benefits with respect to these plans will come primarily from the trusts established for these plans.

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	Pension Plans	Other Plans
	(In thousands)	
2019	$21,667	$1,432
2020	22,965	1,436
2021	22,199	1,438
2022	23,157	1,438
2023	22,081	1,432
2024-2028	111,338	7,196
Total	$223,407	$14,372

We anticipate contributing $6.3 million and $1.4 million to our pension and other postretirement plans, respectively, during 2019.

The pre-tax amounts in accumulated other comprehensive loss that have not yet been recognized as components of net periodic benefit cost at December 31, 2018 and the changes in these amounts during the year ended December 31, 2018 are as follows.

	Pension Benefits	Other Benefits
	(In thousands)	
Components of accumulated other comprehensive loss:		
Net actuarial loss (gain)	$48,466	$(3,047)
Net prior service cost	2,734	—
	$51,200	$(3,047)

	Pension Benefits	Other Benefits
	(In thousands)	
Changes in accumulated other comprehensive loss:		
Net actuarial loss (gain), beginning of year	$44,359	$(1,545)
Amortization of actuarial gain (loss)	(2,810)	12
Actuarial gain	(15,032)	(1,681)
Asset loss	24,755	—
Settlement loss recognized	(1,342)	—
Currency impact	(1,464)	167
Net actuarial loss (gain), end of year	$48,466	$(3,047)
Prior service cost, beginning of year	$11	$—
Amortization of prior service credit	42	—
Prior service cost occurring during the year	2,822	—
Currency impact	(141)	—
Prior service cost, end of year	$2,734	$—

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Note 17: Comprehensive Income and Accumulated Other Comprehensive Income (Loss)

The accumulated balances related to each component of other comprehensive income (loss), net of tax, are as follows:

	Foreign Currency Translation Component	Pension and Other Postretirement Benefit Plans	Accumulated Other Comprehensive Income (Loss)
		(In thousands)	
Balance at December 31, 2016	$ (4,661)	$ (34,406)	$ (39,067)
Other comprehensive gain (loss) loss attributable to Belden before reclassifications	(65,030)	4,504	(60,526)
Amounts reclassified from accumulated other comprehensive loss	—	1,567	1,567
Net current period other comprehensive gain (loss) attributable to Belden	(65,030)	6,071	(58,959)
Balance at December 31, 2017	(69,691)	(28,335)	(98,026)
Other comprehensive gain (loss) attributable to Belden before reclassifications	27,809	(7,813)	19,996
Amounts reclassified from accumulated other comprehensive income	—	3,123	3,123
Net current period other comprehensive gain (loss) attributable to Belden	27,809	(4,690)	23,119
Balance at December 31, 2018	$ (41,882)	$ (33,025)	$ (74,907)

The following table summarizes the effects of reclassifications from accumulated other comprehensive income (loss):

	Amount Reclassified from Accumulated Other Comprehensive Income	Affected Line Item in the Consolidated Statements of Operations and Comprehensive Income
	(In thousands)	
Amortization of pension and other postretirement benefit plan items:		
Settlement loss	$ 1,342	(1)
Actuarial losses	2,798	(1)
Prior service credit	(42)	(1)
Total before tax	4,098	
Tax benefit	(975)	
Total net of tax	$ 3,123	

(1) The amortization of these accumulated other comprehensive income (loss) components are included in the computation of net periodic benefit costs (see Note 16).

Note 18: Share-Based Compensation

Compensation cost charged against income, primarily selling, general and administrative expense, and the income tax benefit recognized for our share-based compensation arrangements is included below:

	Years Ended December 31,		
	2018	2017	2016
		(In thousands)	
Total share-based compensation cost	$18,497	$ 14,647	$18,178
Income tax benefit	4,402	5,566	7,069

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We currently have outstanding stock appreciation rights (SARs), restricted stock units with service vesting conditions, restricted stock units with performance vesting conditions, and restricted stock units with market conditions. We grant SARs with an exercise price equal to the closing market price of our common stock on the grant date. Generally, SARs may be converted into shares of our common stock in equal amounts on each of the first three anniversaries of the grant date and expire 10 years from the grant date. Certain awards provide for accelerated vesting in certain circumstances, including following a change in control of the Company. Restricted stock units with service conditions generally vest 3-5 years from the grant date. Restricted stock units issued based on the attainment of the performance conditions generally vest on the second or third anniversary of their grant date. Restricted stock units issued based on the attainment of market conditions generally vest on the third anniversary of their grant date.

We recognize compensation cost for all awards based on their fair values. The fair values for SARs are estimated on the grant date using the Black-Scholes-Merton option-pricing formula which incorporates the assumptions noted in the following table. Expected volatility is based on historical volatility, and expected term is based on historical exercise patterns of SAR holders. The fair value of restricted stock units with service vesting conditions or performance vesting conditions is the closing market price of our common stock on the date of grant. We estimate the fair value of certain restricted stock units with market conditions using a Monte Carlo simulation valuation model with the assistance of a third party valuation firm. Compensation costs for awards with service conditions are amortized to expense using the straight-line method. Compensation costs for awards with performance conditions and graded vesting are amortized to expense using the graded attribution method.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands, except weighted average fair value and assumptions)		
Weighted-average fair value of SARs and options granted	$ 25.19	$ 27.31	$ 18.79
Total intrinsic value of SARs converted and options exercised	2,263	7,156	9,678
Tax benefit related to share-based compensation	113	967	1,171
Weighted-average fair value of restricted stock shares and units granted	72.54	79.96	54.52
Total fair value of restricted stock shares and units vested	5,740	10,355	8,171
Expected volatility	33.16 %	36.89 %	37.47 %
Expected term (in years)	5.6	5.6	5.7
Risk-free rate	2.70 %	2.01 %	1.32 %
Dividend yield	0.27 %	0.27 %	0.38 %

	SARs and Stock Options				Restricted Shares and Units	
	Number	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value	Number	Weighted-Average Grant-Date Fair Value
		(In thousands, except exercise prices, fair values, and contractual terms)				
Outstanding at January 1, 2018	1,132	$ 62.75			496	$ 78.03
Granted	265	72.34			338	72.54
Exercised or converted	(62)	36.70			(71)	81.48
Forfeited or expired	(46)	73.76			(136)	91.97
Outstanding at December 31, 2018	1,289	$ 65.58	6.6	$ —	627	$ 71.66
Vested or expected to vest at December 31, 2018	1,237	$ 65.33	6.5	$ —		
Exercisable or convertible at December 31, 2018	801	62.88	5.4	—		

At December 31, 2018, the total unrecognized compensation cost related to all nonvested awards was $27.8 million. That cost is expected to be recognized over a weighted-average period of 2.1 years.
Historically, we have issued treasury shares, if available, to satisfy award conversions and exercises.

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Note 19: Preferred Stock
On July 26, 2016, we issued 5.2 million depositary shares, each of which represents 1/100th interest in a share of 6.75% Series B Mandatory Convertible Preferred Stock (the Preferred Stock), for an offering price of $100 per depositary share. Holders of the Preferred Stock may elect to convert their shares into common stock at any time prior to the mandatory conversion date. Unless earlier converted, each share of Preferred Stock will automatically convert into common stock on or around July 15, 2019 into between 120.46 and 132.50 shares of Belden common stock, subject to customary anti-dilution adjustments. This represents a range of 6.2 million to 6.9 million shares of Belden common stock to be issued upon conversion. The number of shares of Belden common stock issuable upon the mandatory conversion of the Preferred Stock will be determined based upon the volume-weighted average price of Belden's common stock over the 20 day trading period beginning on, and including, the 22nd scheduled trading day prior to July 15, 2019. The net proceeds from this offering were approximately $501 million. The net proceeds are for general corporate purposes. With respect to dividend and liquidation rights, the Preferred Stock ranks senior to our common stock and junior to all of our existing and future indebtedness.
Note 20: Stockholder Rights Plan
On March 27, 2018, our Board of Directors authorized the redemption of all outstanding preferred share purchase rights issued pursuant to the then existing Rights Agreement. Under the former Rights Agreement, one right was attached to each outstanding share of common stock. The rights were redeemed at a redemption price of $0.01 per right, resulting in a total payment of $0.4 million to the holders of the rights as of the close of business on March 27, 2018.
Note 21: Share Repurchases
On May 25, 2017, our Board of Directors authorized a share repurchase program, which allowed us to purchase up to $200.0 million of our common stock through open market repurchases, negotiated transactions, or other means, in accordance with applicable securities laws and other restrictions. This program was funded with cash on hand and cash flows from operating activities. During 2018, we repurchased 2.7 million shares of our common stock under the program for an aggregate cost of $175.0 million and an average price per share of $64.94. During 2017, we repurchased 0.3 million shares of our common stock under the program for an aggregate cost of $25.0 million and an average price per share of $79.75. We have utilized all of the $200.0 million authorized under this share repurchase program.

On November 29, 2018, our Board of Directors authorized a share repurchase program, which allows us to purchase up to $300.0 million of our common stock through open market repurchases, negotiated transactions, or other means, in accordance with applicable securities laws and other restrictions. During 2018, we did not repurchase any shares of our common stock under this program.
Note 22: Operating Leases
Operating lease expense incurred primarily for manufacturing and office space, machinery, and equipment was $31.7 million, $38.6 million, and $40.3 million in 2018, 2017, and 2016, respectively.
Minimum annual lease payments for noncancelable operating leases in effect at December 31, 2018 are as follows (in thousands):

2019	$19,877
2020	17,531
2021	14,776
2022	12,317
2023	7,654
Thereafter	28,771
	$100,926

Certain of our operating leases include step rent provisions and rent escalations. We include these step rent provisions and rent escalations in our minimum lease payments obligations and recognize them as a component of rental expense on a straight-line basis over the minimum lease term.

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Note 23: Market Concentrations and Risks

Concentrations of Credit

We sell our products to many customers in several markets across multiple geographic areas. The ten largest customers, of which six are distributors, constitute in aggregate approximately 34%, 35%, and 33% of revenues in 2018, 2017, and 2016, respectively.

Unconditional Commodity Purchase Obligations

At December 31, 2018, we were committed to purchase approximately 1.8 million pounds of copper at an aggregate fixed cost of $5.0 million. At December 31, 2018, this fixed cost was $0.2 million more than the market cost that would be incurred on a spot purchase of the same amount of copper. The aggregate market cost was based on the current market price of copper obtained from the New York Mercantile Exchange.

Labor

Approximately 21% of our labor force is covered by collective bargaining agreements at various locations around the world. Approximately 15% of our labor force is covered by collective bargaining agreements that we expect to renegotiate during 2019.

Fair Value of Financial Instruments

Our financial instruments consist primarily of cash and cash equivalents, trade receivables, trade payables, and debt instruments. The carrying amounts of cash and cash equivalents, trade receivables, and trade payables at December 31, 2018 are considered representative of their respective fair values. The fair value of our senior subordinated notes at December 31, 2018 and 2017 was approximately $1,485.0 million and $1,619.3 million, respectively, based on quoted prices of the debt instruments in inactive markets (Level 2 valuation). This amount represents the fair values of our senior subordinated notes with a carrying value of $1,485.9 million and $1,584.2 million as of December 31, 2018 and 2017, respectively.

Note 24: Contingent Liabilities

General

Various claims are asserted against us in the ordinary course of business including those pertaining to income tax examinations, product liability, customer, employment, vendor, and patent matters. Based on facts currently available, management believes that the disposition of the claims that are pending or asserted will not have a materially adverse effect on our financial position, operating results, or cash flow.

Letters of Credit, Guarantees and Bonds

At December 31, 2018, we were party to unused standby letters of credit, bank guarantees, and surety bonds totaling $7.5 million, $3.9 million, and $2.4 million, respectively. These commitments are generally issued to secure obligations we have for a variety of commercial reasons, such as workers compensation self-insurance programs in several states and the importation and exportation of product.

Note 25: Supplemental Cash Flow Information

Supplemental cash flow information is as follows:

	Years Ended December 31,		
	2018	2017	2016
		(In thousands)	
Income tax refunds received	$4,782	$ 5,031	$3,838
Income taxes paid	(54,109)	(35,893)	(26,587)
Interest paid	(48,519)	(79,047)	(87,076)

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Note 26: Quarterly Operating Results (Unaudited)

2018	1st	2nd	3rd	4th	Year
	(In thousands, except days and per share amounts)				
Number of days in quarter	91	91	91	92	365
Revenues	$605,565	$668,639	$655,774	$655,390	$2,585,368
Gross profit	230,594	257,596	260,857	259,365	1,008,412
Operating income	44,203	56,506	131,278	73,234	305,221
Net income	2,570	28,792	85,858	43,491	160,711
Less: Net loss attributable to noncontrolling interest	(48)	(77)	(23)	(35)	(183)
Net income attributable to Belden	2,618	28,869	85,881	43,526	160,894
Less: Preferred stock dividends	8,733	8,733	8,732	8,733	34,931
Net income (loss) attributable to Belden common stockholders	(6,115)	20,136	77,149	34,793	125,963
Basic income (loss) per share attributable to Belden common stockholders:	$(0.15)	$0.49	$1.90	$0.87	$3.10
Diluted income (loss) per share attributable to Belden stockholders:	$(0.15)	$0.49	$1.80	$0.87	$3.08

Included in the first, second, third, and fourth quarters of 2018 are severance, restructuring, and integration costs of $20.4 million, $24.9 million, $11.7 million, and $11.6 million, respectively.

2017	1st	2nd	3rd	4th	Year
	(In thousands, except days and per share amounts)				
Number of days in quarter	92	91	91	91	365
Revenues	$551,381	$610,633	$621,745	$604,884	$2,388,643
Gross profit	222,374	243,104	239,849	229,426	934,753
Operating income	51,597	62,776	61,116	59,915	235,404
Net Income	25,581	35,891	945	30,436	92,853
Less: Net loss attributable to noncontrolling interest	(106)	(86)	(82)	(83)	(357)
Net income attributable to Belden	25,687	35,977	1,027	30,519	93,210
Less: Preferred stock dividends	8,733	8,733	8,732	8,733	34,931
Net income (loss) attributable to Belden common stockholders	16,954	27,244	(7,705)	21,786	58,279
Basic income (loss) per share attributable to Belden common stockholders:	$0.40	$0.64	$(0.18)	$0.52	$1.38
Diluted income (loss) per share attributable to Belden common stockholders:	$0.40	$0.64	$(0.18)	$0.51	$1.37

During the financial closing process for the fourth quarter of 2017, we determined that certain consolidated financial statement amounts were not recorded correctly in prior interim periods of 2017. We evaluated these errors and concluded that they were not material to any of our previously issued interim financial statements and did not require restatement of the quarters. The errors primarily related to recognizing revenue prior to satisfying all of the delivery criteria in one business within our Enterprise segment. The impact of the errors in the first, second, and third quarters of 2017 was an overstatement of revenues of $6.1 million, $10.4 million, and $11.8 million, respectively, and an overstatement of net income of $3.0 million, $1.3 million, and $2.6 million, respectively. The impact of the errors in the fourth quarter of 2017 was an understatement of revenues of $27.8 million and an understatement of net income of $5.2 million. All of the errors were corrected as of December 31, 2017.

Included in the first, second, third, and fourth quarters of 2017 are severance, restructuring, and integration costs of $6.6 million, $9.6 million, $16.7 million, and $9.9 million, respectively.

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Note 27: Subsequent Events

We signed a settlement agreement with the sellers ("Claimant") of SAM on January 30, 2019 for claims arising over the timing of the earnout consideration outlined in the purchase agreement. As part of the settlement, the parties agreed that the earnout consideration would be payable during the first quarter 2020, unless earlier payment is required as per the terms of the purchase agreement, and Belden would immediately pay the Claimant $0.9 million for interest and fees incurred, which we recognized in selling, general, and administrative expenses in our 2018 financial statements.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

In accordance with Securities Exchange Act Rules 13a-15(e) and 15d-15(e), our management, under the supervision of our Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. As permitted, that evaluation excluded the business operations of SAM which was acquired in 2018. The acquired business operations excluded from our evaluation constituted approximately 5% of our total assets as of December 31, 2018, and 5% and (-9%) of our revenues and operating income, respectively, for the year ended December 31, 2018. The operations of the acquired business will be included in our 2019 evaluation. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2018.

Management’s Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal controls over financial reporting for the Company. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) promulgated under the Securities Exchange Act of 1934, as amended, as a process designed by, or under the supervision of, the company’s principal executive and principal financial officers and effected by the company’s board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the company’s assets that could have a material effect on the financial statements.

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

Internal control over financial reporting cannot provide absolute assurance of achieving financial reporting objectives because of its inherent limitations. Internal control over financial reporting is a process that involves human diligence and compliance and is subject to lapses in judgment and breakdowns resulting from human failures. Internal control over financial reporting can also be circumvented by collusion or improper management override. Because of such limitations, there is a risk that material misstatements may not be prevented or detected on a timely basis by internal control over financial reporting. However, these inherent limitations are known features of the financial reporting process. Therefore, it is possible to design into the process safeguards to reduce, though not eliminate, this risk.

The Company’s management assessed the effectiveness of the Company’s internal controls over financial reporting as of December 31, 2018. In making this assessment, the Company’s management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (COSO) in Internal Control-Integrated Framework.
Based on that assessment, the Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2018, the Company’s internal control over financial reporting was effective.

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Our internal controls over financial reporting as of December 31, 2018 have been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report that follows.
In 2017, the Chief Executive Officer and Chief Financial Officer concluded that our internal controls over financial reporting were not effective as of December 31, 2017. Within our Grass Valley business unit, headquartered in Montreal, Quebec, Canada, we did not maintain internal controls that were sufficiently designed and operating effectively to ensure that all revenue recognition criteria were satisfied prior to the recognition of revenue. Prior to issuing the fourth quarter and full year 2017 consolidated financial statements, we determined that this control deficiency led to the inappropriate recognition of revenue including certain transactions in which Grass Valley recognized revenue for products upon shipment to third party logistics providers rather than ultimate shipment to the customer-specified final destination. This control deficiency created a reasonable possibility that a material misstatement to the consolidated financial statements would not be prevented or detected on a timely basis and, therefore, we concluded that the deficiency represented a material weakness in the Company's internal control over financial reporting as of December 31, 2017.

Remediation of the Material Weakness in Internal Control over Financial Reporting
The Company implemented changes in order to remediate the identified material weakness which included the following: (1) enhanced and revised the revenue recognition review control to ensure that it is designed to provide assurance that revenues are recognized at the appropriate time and under the appropriate circumstances, (2) provided additional training to key members of our accounting and finance teams across all of our segments to ensure revenue recognition criteria is fully understood Company-wide, (3) provided further Company-wide revenue recognition training to appropriate accounting, finance and operations personnel to ensure compliance with the revenue recognition criteria under the new ASC 606 revenue standard that we adopted on January 1, 2018, and (4) re-evaluated and changed the structure of Grass Valley's accounting and finance organization to confirm the presence of the technical knowledge required for each position. The material weakness is remediated as the applicable controls have been designed appropriately and have operated for a sufficient period of time. Management has concluded, through testing, that these controls are operating effectively.

Changes to Internal Control over Financial Reporting
Other than the remediation actions described above, there were no changes to our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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Report of Independent Registered Public Accounting Firm
To the Stockholders and the Board of Directors of Belden Inc.

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

As indicated in the accompanying Management's Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of Snell Advanced Media, which is included in the 2018 consolidated financial statements of the Company and constituted 5% of total assets as of December 31, 2018 and 5% and (-9%) of revenues and operating income, respectively, for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of Snell Advanced Media.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of Belden Inc. as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and the financial statement schedule listed in the Index at Item 15(a) and our report dated February 20, 2019 expressed an unqualified opinion thereon.

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

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

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

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

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

/s/ Ernst & Young LLP
St. Louis, Missouri
February 20, 2019

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Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Information regarding directors is incorporated herein by reference to “Item I-Election of Ten Directors,” as described in the Proxy Statement. Information regarding executive officers is set forth in Part I herein under the heading “Executive Officers.” The additional information required by this Item is incorporated herein by reference to “Corporate Governance” (opening paragraph and table), “Corporate Governance-Audit Committee,” “Ownership Information-Section 16(a) Beneficial Ownership Reporting Compliance,” “Corporate Governance-Corporate Governance Documents” and “Other Matters-Stockholder Proposals for the 2019 Annual Meeting,” as described in the Proxy Statement.

Item 11. Executive Compensation

Incorporated herein by reference to “Executive Compensation,” “Corporate Governance-Director Compensation,” “Corporate Governance-Related Party Transactions and Compensation Committee Interlocks” and “Corporate Governance-Board Leadership Structure and Role in Risk Oversight” as described in the Proxy Statement.

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

Incorporated herein by reference to “Ownership Information-Equity Compensation Plan Information on December 31, 2018” and “Ownership Information-Stock Ownership of Certain Beneficial Owners and Management” as described in the Proxy Statement.

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

Incorporated herein by reference to “Corporate Governance-Related Party Transactions and Compensation Committee Interlocks” and “Corporate Governance” (paragraph following the table) as described in the Proxy Statement.

Item 14. Principal Accountant Fees and Services

Incorporated herein by reference to “Public Accounting Firm Information-Fees to Independent Registered Public Accountants for 2018 and 2017” and “Public Accounting Firm Information-Audit Committee’s Pre-Approval Policies and Procedures” as described in the Proxy Statement.

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PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Documents filed as part of this Report:

1. Financial Statements
Report of Independent Registered Public Accounting Firm
Consolidated Balance Sheets as of December 31, 2018 and December 31, 2017
Consolidated Statements of Operations for Each of the Three Years in the Period Ended December 31, 2018
Consolidated Statements of Comprehensive Income for Each of the Three Years in the Period Ended December 31, 2018
Consolidated Cash Flow Statements for Each of the Three Years in the Period Ended December 31, 2018
Consolidated Stockholders' Equity Statements for Each of the Three Years in the Period Ended December 31, 2018
Notes to Consolidated Financial Statements

2. Financial Statement Schedule
Schedule II – Valuation and Qualifying Accounts

	Beginning Balance	Charged to Costs and Expenses	Divestitures/ Acquisitions	Charge Offs	Recoveries	Currency Movement	Ending Balance
			(In thousands)				
Accounts Receivable—							
Allowance for Doubtful Accounts:							
2018	$7,766	$ 1,273	$1,168	$(1,389)	$(293)	$(294)	$8,231
2017	8,104	950	38	(905)	(995)	574	7,766
2016	8,281	2,517	(1)	(1,336)	(1,046)	(311)	8,104
Inventories—							
Excess and Obsolete Allowances:							
2018	$25,269	$ 3,659	$6,204	$(3,328)	$(2,709)	$(199)	$28,896
2017	24,561	2,348	2,628	(3,219)	(2,205)	1,156	25,269
2016	22,531	3,921	(706)	—	(1,142)	(43)	24,561
Deferred Income Tax Asset—							
Valuation Allowance:							
2018	$151,841	$ 20,274	$33,870	$(93,432)	$(17,930)	$(3,751)	$90,872
2017	104,771	39,307	—	(3,322)	(1,712)	12,797	151,841
2016	117,071	10,782	616	(8,074)	(10,526)	(5,098)	104,771

All other financial statement schedules not included in this Annual Report on Form 10-K are omitted because they are not applicable.

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3. Exhibits

The following exhibits are filed herewith or incorporated herein by reference, as indicated. Documents indicated by an asterisk (*) identify each management contract or compensatory plan.

Exhibit Number	Description of Exhibit	The filings referenced for incorporation by reference are Company (Belden Inc.) filings unless noted to be those of Belden 1993 Inc.
3.1	Certificate of Incorporation, as amended	February 29, 2008 Form 10-K, Exhibit 3.1
3.2	Certificate of Designations of 6.75% Series B Mandatory Convertible Preferred Stock of Belden Inc.	July 26, 2016 Form 8-K, Exhibit 3.1
3.3	Amended and Restated Bylaws	May 31, 2016 Form 8-K, Exhibit 3.1
4.1	Deposit Agreement dated July 26, 2016, by and among Belden Inc., American Stock Transfer & Trust Company, LLC, and The Holders of the Depositary Receipts Described Therein	July 26, 2016 Form 8-K, Exhibit 4.2
4.2	Indenture relating to 4.125% Senior Subordinated Notes due 2026	October 11, 2016 Form 8-K, Exhibit 4.1
4.3	First Supplemental Indenture relating to 4.125% Senior Subordinated Notes due 2026	June 26, 2017 Form 8-K, Exhibit 4.22
4.4	Indenture relating to 3.375% Senior Subordinated Notes due 2027	July 10, 2017 Form 8-K, Exhibit 4.1
4.5	Indenture relating to 2.875% Senior Subordinated Notes due 2025	September 22, 2017 Form 8-K, Exhibit 4.1
4.6	Indenture relating to 3.875% Senior Subordinated Notes due 2028	March 16, 2018 Form 8-K, Exhibit 4.1
10.1	Trademark License Agreement	November 15, 1993 Form 10-Q of Belden 1993 Inc., Exhibit 10.2
10.2*	CDT 2001 Long-Term Performance Incentive Plan, as amended	April 6, 2009 Proxy Statement, Appendix I
10.3*	Belden Inc. 2011 Long Term Incentive Plan, as amended	April 6,2016 Proxy Statement, Appendix II
10.4*	Form of Stock Appreciation Rights Award	August 3, 2016 Form 10-Q, Exhibit 10.1
10.5*	Form of Performance Stock Units Award	August 3, 2016 Form 10-Q, Exhibit 10.2

10.6*	Form of Restricted Stock Units Award	May 6, 2014 Form 10-Q, Exhibit 10.3
10.7*	Belden Inc. Annual Cash Incentive Plan, as amended and restated	February 29, 2012 Form 10-K, Exhibit 10.16
10.8*	2004 Belden CDT Inc. Non-Employee Director Deferred Compensation Plan	December 21, 2004 Form 8-K, Exhibit 10.1
10.9*	Belden Wire & Cable Company (BWC) Supplemental Excess Defined Benefit Plan	March 22, 2002 Form 10-K of Belden 1993 Inc., Exhibit 10.14
10.10*	First Amendment to Belden Wire & Cable Company (BWC) Supplemental Excess Defined Benefit Plan	March 22, 2002 Form 10-K of Belden 1993 Inc., Exhibit 10.15

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Exhibit Number	Description of Exhibit	The filings referenced for incorporation by reference are Company (Belden Inc.) filings unless noted to be those of Belden 1993 Inc.
10.11*	Second Amendment to Belden Wire & Cable Company (BWC) Supplemental Excess Defined Benefit Plan	March 14, 2003 Form 10-K of Belden 1993 Inc., Exhibit 10.21
10.12*	Third Amendment to Belden Wire & Cable Company (BWC) Supplemental Excess Defined Benefit Plan	November 15, 2004 Form 10-Q, Exhibit 10.50
10.13*	BWC Supplemental Excess Defined Contribution Plan	March 22, 2002 Form 10-K of Belden 1993 Inc., Exhibit 10.16
10.14*	First Amendment to BWC Supplemental Excess Defined Contribution Plan	March 22, 2002 Form 10-K of Belden 1993 Inc., Exhibit 10.17
10.15*	Second Amendment to BWC Supplemental Excess Defined Contribution Plan	2003 Form 10-K of Belden 1993 Inc., Exhibit 10.24
10.16*	Third Amendment to BWC Supplemental Excess Defined Contribution Plan	November 15, 2004 Form 10-Q, Exhibit 10.51
10.17*	Trust Agreement	November 15, 2004 Form 10-Q, Exhibit 10.52
10.18*	First Amendment to Trust Agreement	November 15, 2004 Form 10-Q, Exhibit 10.53
10.19*	Trust Agreement	November 15, 2004 Form 10-Q, Exhibit 10.54
10.20*	First Amendment to Trust Agreement	November 15, 2004 Form 10-Q, Exhibit 10.55
10.21*	Amended and Restated Executive Employment Agreement with John Stroup	April 7, 2008 Form 8-K, Exhibit 10.1
10.22*	First Amendment to Amended and Restated Executive Employment Agreement with John Stroup	December 17, 2008 Form 8-K, Exhibit 10.1
10.23*	Amended and Restated Executive Employment Agreement with Henk Derksen	January 5, 2012 Form 8-K, Exhibit 10.1
10.24*	Executive Employment Agreement with Glenn Pennycook	August 8, 2013 Form 10-Q, Exhibit 10.1
10.25*	Executive Employment Agreement with Dhrupad Trivedi	August 8, 2013 Form 10-Q, Exhibit 10.2
10.26*		November 6, 2013 Form 10-Q, Exhibit 10.1

	Executive Employment Agreement with Doug Zink	
10.27*	Executive Employment Agreement with Ross Rosenberg	August 5, 2014 Form 10-Q, Exhibit 10.1
10.28*	Executive Employment Agreement with Roel Vestjens	August 5, 2014 Form 10-Q, Exhibit 10.2
10.29*	Executive Employment Agreement with Brian Anderson	May 5, 2015 Form 10-Q, Exhibit 10.1
10.30*	Executive Employment Agreement with Dean McKenna	August 4, 2015 Form 10-Q Exhibit 10.1
10.31*	Executive Employment Agreement with Paul Turner	February 13, 2018 Form 10-K Exhibit 10.31
10.32*	Executive Employment Agreement with Leo Kulmaczewski	November 5, 2018 Form 10-Q Exhibit 10.1

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Exhibit Number	Description of Exhibit	The filings referenced for incorporation by reference are Company (Belden Inc.) filings unless noted to be those of Belden 1993 Inc.
10.33*	Form of Indemnification Agreement with each of the Directors and Brian Anderson, Henk Derksen, Dean McKenna, Glenn Pennycook, Ross Rosenberg, John Stroup, Dhrupad Trivedi, Paul Turner, Roel Vestjens, and Doug Zink	March 1, 2007 Form 10-K, Exhibit 10.39
10.34	Amended and Restated Credit Agreement	May 22, 2017, Form 8-K, Exhibit 10.1
10.35	Purchase Agreement by and among Belden Inc., the Guarantors named therein and Deutsche Bank AG	June 29, 2017 Form 8-K, Exhibit 10.1
10.36	Purchase Agreement by and among Belden Inc., the Guarantors named therein and Deutsche Bank AG	September 14, 2017 Form 8-K, Exhibit 10.1
10.37	Purchase Agreement by and among Belden Inc., the Guarantors named therein and Deutsche Bank AG	March 8, 2018 Form 8-K, Exhibit 10.1
14.1	Code of Ethics	August 26, 2016 Form 8-K, Exhibit 14.1
21.1	List of Subsidiaries of Belden Inc.	Filed herewith
23.1	Consent of Ernst & Young LLP	Filed herewith
24.1	Powers of Attorney from Members of the Board of Directors	Filed herewith
31.1	Rule 13a-14(a)/15d-14(a) Certification of the Chief Executive Officer	Filed herewith
31.2	Rule 13a-14(a)/15d-14(a) Certification of the Chief Financial Officer	Filed herewith
32.1	Section 1350 Certification of the Chief Executive Officer	Filed herewith
32.2	Section 1350 Certification of the Chief Financial Officer	Filed herewith

Exhibit 101.INS XBRL Instance Document
Exhibit 101.SCH XBRL Taxonomy Extension Schema
Exhibit 101.CAL XBRL Taxonomy Extension Calculation
Exhibit 101.DEF XBRL Taxonomy Extension Definition
Exhibit 101.LAB XBRL Taxonomy Extension Label
Exhibit 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document

*Management contract or compensatory plan

Copies of the above Exhibits are available to shareholders at a charge of $0.25 per page, minimum order of $10.00.
Direct requests to:
Belden Inc., Attention: Corporate Secretary
1 North Brentwood Boulevard, 15th Floor
St. Louis, Missouri 63105

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Signatures

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

BELDEN INC.

By /s/ JOHN S. STROUP
John S. Stroup
President, Chief Executive Officer, and Chairman

Date: February 20, 2019

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

/s/ JOHN S. STROUP John S. Stroup	President, Chief Executive Officer, and Chairman	February 20, 2019
/s/ HENK DERKSEN Henk Derksen	Senior Vice President, Finance, and Chief Financial Officer	February 20, 2019
/s/ DOUGLAS R. ZINK Douglas R. Zink	Vice President and Chief Accounting Officer	February 20, 2019
/s/ DAVID ALDRICH* David Aldrich	Lead Independent Director	February 20, 2019
/s/ LANCE C. BALK* Lance C. Balk	Director	February 20, 2019
/s/ STEVEN BERGLUND* Steven Berglund	Director	February 20, 2019
/s/ DIANE D. BRINK* Diane D. Brink	Director	February 20, 2019
/s/ JUDY L. BROWN* Judy L. Brown	Director	February 20, 2019
/s/ BRYAN C. CRESSEY* Bryan C. Cressey	Director	February 20, 2019

/s/ JONATHAN KLEIN* Jonathan Klein	Director	February 20, 2019
/s/ GEORGE MINNICH* George Minnich	Director	February 20, 2019
/s/ JOHN MONTER* John Monter	Director	February 20, 2019

/s/ JOHN S. STROUP
*By John S. Stroup, Attorney-in-fact

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