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Title of each class	Name of each exchange on which registered
Common Stock, par value \$.01 per share	Nasdaq

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

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

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

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

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

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

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

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

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

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.

The aggregate market value of the shares of Common Stock held by non-affiliates of the registrant was approximately \$5,530 million as of June 30, 2018. For purposes of this computation, shares held by affiliates and by directors and officers of the registrant have been excluded.

As of February 7, 2019 there were 192,380,278 shares of the registrant's Common Stock outstanding.

Documents Incorporated by Reference

Portions of the registrant's Proxy Statement for the 2019 Annual Meeting of Stockholders are incorporated by reference in Part III hereof.

CommScope Holding Company, Inc.

Form 10-K

December 31, 2018

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PART I

Unless the context otherwise requires, references to “CommScope Holding Company, Inc.,” “CommScope,” “the Company,” “Registrant,” “we,” “us,” or “our” are to CommScope Holding Company, Inc. and its direct and indirect subsidiaries on a consolidated basis.

This Annual Report on Form 10-K includes certain statements that constitute “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, which reflect our current views with respect to future events and financial performance. These forward-looking statements are generally identified by their use of such terms and phrases as “intend,” “goal,” “estimate,” “expect,” “project,” “projections,” “plans,” “anticipate,” “should,” “could,” “designed to,” “foreseeable future,” “believe,” “this,” “outlook,” “target,” “guidance” and similar expressions, although not all forward-looking statements contain such terms. This list of indicative terms and phrases is not intended to be all-inclusive. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date the statement was made.

These statements are subject to various risks and uncertainties, many of which are outside our control. Item 1A, “Risk Factors,” of this Annual Report on Form 10-K sets forth more detailed information about the factors that may cause our actual results to differ, perhaps materially, from the views stated in such forward-looking statements. Although the information contained in this Annual Report on Form 10-K represents our best judgment as of the date of this report based on information currently available and reasonable assumptions, we can give no assurance that the expectations will be attained or that any deviation will not be material. Given these uncertainties, we caution you not to place undue reliance on these forward-looking statements, which speak only as of the date made. We are not undertaking any duty or obligation to update any forward-looking statements to reflect developments or information obtained after the date of this Annual Report on Form 10-K, except to the extent required by law.

ITEM 1. BUSINESS

Company Overview

We are a global leader in providing infrastructure solutions for communications networks. Our portfolio includes robust and innovative wireless, fiber optic and copper solutions for today’s evolving digital lifestyle. Our talented and experienced global team helps customers increase bandwidth; maximize existing capacity; improve network response time and performance; and simplify technology migration. Our solutions are found in some of the largest venues and outdoor spaces; in data centers and buildings of all shapes, sizes and complexities; at wireless cell sites; in telecom central offices and cable television headends; in fiber-to-the-X (FTTX) deployments; and in airports, trains, and tunnels. Vital networks around the world run on CommScope solutions.

We have a team of over 20,000 people to serve our customers in over 100 countries through a network of more than 30 world-class manufacturing and distribution facilities strategically located around the globe. Our customers include substantially all of the leading global telecommunication operators, data center managers, leading multi-system operators (MSOs) and thousands of enterprise customers, including many Fortune 500 companies. We have long-standing, direct relationships with our customers and serve them through a direct sales force and a global network of channel partners.

On November 8, 2018, we announced an agreement to acquire ARRIS International plc (ARRIS) in an all cash transaction with a total purchase price of approximately \$7.4 billion, or \$31.75 per share. We expect the transaction to close during the first half of 2019. See “ARRIS Acquisition Rationale” under our “Strategy” section within this Part I, Item 1, “Business” for a discussion of strategy behind the acquisition of ARRIS and see “ARRIS Acquisition Risks” in Part I, Item 1A., “Risk Factors” for a discussion of risks related to the pending acquisition of ARRIS.

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For the year ended December 31, 2018, our revenues were \$4.57 billion and our net income was \$140.2 million. For further discussion of our current and prior year financial results, see Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

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CommScope enables and empowers many of the top-performing wireless, telecommunications, business enterprise, broadband and cable television networks in existence today by providing solutions for the service provider and enterprise (including hyperscale and cloud data centers) markets. The table below summarizes 2018 revenue, global leadership position and solutions offerings for our two segments:

	Connectivity Solutions (CCS)	Mobility Solutions (CMS)
2018 Revenue	\$2,813 million	\$1,756 million
Global Leadership Position	A global leader in innovative fiber optic and copper connectivity solutions for use in data centers and business enterprise, telecommunications, cable television and residential broadband networks	A global leader in providing infrastructure for the most advanced wireless networks
Service Providers	<ul style="list-style-type: none"> •High-capacity fiber and apparatus •Plug and play hardened connector systems for harsh environments •FTTX solutions •Fiber distribution hubs and management systems •Broadband MSO solutions •Intelligent infrastructure management hardware and software •Residential connectivity (amplifiers, splitters, drop cable, interconnects) •Fiber and central office LAN solutions 	<ul style="list-style-type: none"> •Base station antenna systems •Interconnectivity (fiber, hybrid fiber/power and coaxial feeder cabling, connectors and assemblies) •Radio frequency (RF) conditioning and interference mitigation (amplifiers, filters, diplexers and combiners) •Metro cell antenna and concealment solutions •Distributed antenna system (DAS) and small cell solutions •Microwave backhaul antennas and power solutions
Enterprise (including Hyperscale and Cloud Data Centers)	<ul style="list-style-type: none"> •Single mode and multi-mode fiber and apparatus •Coaxial and structured copper cabling systems and apparatus •Campus network fiber cabling systems •Intelligent infrastructure management hardware and software 	<ul style="list-style-type: none"> •In-building cellular solutions

- Quick-turn delivery of fiber and copper assemblies
- High density fiber connectivity (shelves/panels, modules, trunks, jumpers/arrays and cable)
- Pre-terminated fiber and copper cable and connectivity
- Intelligent infrastructure management hardware and software
- Data center raceways and cable assemblies

Industry Background

We participate in the large and growing global market for connectivity and essential communications infrastructure. This market is being driven by the growth in bandwidth demand associated with the continued demand of smartphones, tablets and machine-to-machine (M2M) communication as well as the proliferation of data centers, Big Data, cloud-based services, streaming media content and the Internet of Things (IoT). Telecommunications operators are densifying 4G networks and deploying 5G and fiber optic networks to support the dramatic growth in bandwidth demand. As users consume more data on smartphones, tablets and computers, enterprises face a growing need for higher bandwidth networks, in-building cellular coverage and more robust, efficient and intelligent data centers. Operators are investing in their networks to deliver a competitive triple-play of services (voice, video and high-speed data) and to maintain service quality. There are several major trends that we expect to drive network deployments and investment, including:

Evolving Network Architecture

The pace of change in networking has increased as consumers and data-driven businesses utilize more bandwidth and shift toward ubiquitous mobile applications. Exponential growth in video and “universal mobility” are revolutionizing how we connect to each other and changing the network architecture needed to support consumer demand. This trend requires better network coverage, greater broadband access, and increased capacity and data storage.

Operators are working to transition their networks to become faster and more efficient. CommScope sees several key network trends that will continue to impact CommScope and the industry during 2019 and beyond:

- 1) Network Convergence: Operators are moving toward converged or multi-use network architectures. Rather than building upon independent wireline and wireless networks, operators are now shifting toward networks that combine voice, video and data communications into a single, converged network. In fact, we are developing solutions that support the convergence of wireline and wireless networks for 5G. These changes are expected to help operators increase the efficiency and capability of the network, improve asset utilization and reduce cost. We expect that fiber and wireless technologies will continue to be essential building blocks of converged networks. Convergence of fiber-based broadband networks and traditional wireless networks will be essential for the success of 5G technologies.
- 2) Densification: As wireless operators work to meet consumer demand, they utilize three primary tools to increase capacity: a) adding wireless spectrum, b) improving network efficiency and c) increasing network density (i.e., adding more cell sites or sectors to an existing cell site). Although the Company benefits from all three strategies, densification of cell sites is expected to be a key driver as operators transition toward 5G networks. A solid 4G network will be the foundation for 5G. Densification includes enhanced sectorization at macro cell sites, building new metro cell or small cell sites and establishing better in-building coverage. The Company expects that densification will require significant fiber cable and connectivity between wireless cell sites (fronthaul, crosshaul and backhaul).
- 3) Virtualization and Centralization: Operators are virtualizing and centralizing wireless networks to make them more flexible and efficient. The first step toward capacity virtualization is deploying centralized radio access networks (CRAN). CRAN is a centralized computing architecture for radio networks which requires installation of direct fiber connectivity to individual cell sites. By leveraging the signal carrying capacity of fiber, operators can centrally control dozens or even hundreds of cell sites in the network. Centralizing independent wireless base stations can support the efficient distribution of capacity, improve network response time, reduce the amount of equipment needed at each individual cell site, and lower power and leasing costs. These CRAN nodes will evolve to become “Cloud RAN” nodes as operators “virtualize” the network by combining hardware and software network resources and network functionality into a single, software-based administrative entity. Network virtualization also supports the transition to 5G.

4) Optimization: Deployment of wired and wireless networks is complex and costly. Operators are highly focused on optimizing network resources and reducing the total cost of ownership. Optimization includes techniques such as innovative fiber connectivity solutions to reduce installation time, network intelligence to monitor equipment efficiency, precise antenna patterns to optimize cell site capacity, spectrum reuse, offloading traffic onto Wi-Fi and utilization of unlicensed spectrum—especially inside buildings.

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Fiber Deep Deployments

Residential and business bandwidth consumption continues to grow substantially. The proliferation of over-the-top video, multiscreen viewing, cloud services and social media are prompting operators to accelerate fiber deployment. Operators can increase network capacity by installing fiber deeper into their networks. Although consumer devices are increasingly connected to the network via a wireless connection such as LTE or Wi-Fi, these wireless access points must have abundant backhaul capacity available to provide consumers the experience they expect. Operators around the globe are deploying fiber deep to build next generation networks. These networks use the capabilities of fiber to enable consumers access to content at higher speeds with lower network response time. As networks improve and deliver higher speed and greater reliability, many operators are choosing to provide both residential and business services over a common physical layer infrastructure, saving them time and money. In addition, with the deployments of metro cells, outdoor small cells and fixed wireless broadband to the home, these same service providers are planning to utilize this common physical layer infrastructure to provide connectivity to these wireless access points.

Shift in Enterprise Spending

Several trends in the enterprise market are expected to create opportunities and challenges. First, the shift toward mobility in business enterprises is expected to impact the amount and type of structured copper connectivity needed over the longer-term. As the bandwidth requirements for Wi-Fi and indoor cellular networks increase, more access points will be needed throughout commercial buildings. As a result, enterprises are expected to adjust in-building cabling designs to deliver both power and high-speed data to those devices. Power-over-ethernet is expected to become increasingly important as the number of devices used for Wi-Fi and indoor cellular networks multiplies. While enterprises continue to need copper connectivity to power edge devices, enterprises are deploying fiber more extensively in data centers. Over the next several years, we expect the growing demand for fiber solutions to result in decelerating demand for copper solutions in networks. Due to huge increases in data traffic and migration of applications to the cloud, enterprises are also shifting spending toward multi-tenant (co-located) data centers and hyperscale cloud service providers, which offer cloud data center services as a replacement to in-house corporate data centers. Multi-tenant and hyperscale data center managers are focused on ultra-low loss, high density, scalable fiber connectivity solutions.

An increase in average data center size and the number of assets in a data center significantly raises the total cost of ownership and the complexity of managing data center infrastructure. Data center operators strive to manage their resources efficiently and to reduce energy consumption by monitoring all elements within the data center. Automated infrastructure management software helps operators improve operational efficiency, maximize capability and reduce costs by providing clear insight into cooling capacity, power usage, utilization, applications and overall performance.

Momentum of 5G

5G wireless is evolving from an industry vision toward a tangible, next generation wireless technology. Some operators have begun a transition to 5G wireless and have announced trials and pre-standard deployments of 5G technology. The primary benefits of 5G are expected to include:

- Enhanced mobile broadband—to support significant improvement in data rates and user experience,
- IoT and M2M communications to support the expected billions of connections between machines as well as short bursts of information to other systems, and
- Ultra-fast response time—to support applications like public safety, autonomous vehicles and drones.

Densification, virtualization and optimization of the network are all required to support 5G. Operators will need to both acquire and launch new spectrum for 5G, as well as continue their strategy of re-allocation of spectrum from one generation to another. Some of this spectrum will be at much higher frequencies and will use new technologies to deliver exceptional amounts of bandwidth to subscribers. 5G also requires significant fiber to connect wireless access points to each other to improve the response time of the network. As operators transition toward 5G, they must also manage the fundamental network deployment issues of site acquisition, power, backhaul and in-building wireless proliferation.

Metro Cell, DAS and Small Cell Investment to Enhance and Expand Wireless Coverage and Capacity

The traditional macro cell network requires mobile users to connect directly to macro cell base stations. Macro cells are primarily designed to provide coverage over wide areas and typically transmit high power. Alone, they are not optimal for dense urban areas where physical structures often create coverage gaps and capacity is frequently constrained. Adding new macro cells or increasing the number of sectors on existing sites has been the traditional way to increase mobile capacity and will continue to be a foundational layer of the network. As demand growth continues to outpace macro cell capacity growth, new solutions are required for densely populated areas. Metro cells and indoor networks have emerged as important layers of the network. Metro cells are smaller outdoor cell sites, located closer to the ground, having a lower power level than a traditional macro cell site. Metro cells blend into their environment and are often found integrated with traditional street furniture, which helps alleviate zoning restrictions that have made traditional deployments difficult. Finally, there are small cell and DAS solutions that address the capacity and speed requirements from an indoor perspective. These systems provide coverage and capacity to the indoor environment and reduce the load from the macro and metro layers, which improves overall network performance. Small cell and DAS systems may range from small single operator, single-band, low-capacity systems for use in enterprise buildings to large multi-carrier, multi-technology, multi-band systems for use in high-capacity public venues.

Wireless operators view in-building coverage as a critical component of their network deployment strategies. Key challenges for wireless operators in providing in-building cellular coverage are signal loss while penetrating building structures and interference created by mobile devices while connected to macro cell sites. In-building DAS solutions bring the antenna significantly closer to the user, which results in better coverage and capacity while simultaneously reducing interference. In-building DAS provides seamless signal handover for users inside buildings and can support multi-operator, multi-frequency and multi-protocol (2G, 3G, 4G and 5G) solutions. Small cells are self-contained radio units that generally provide support for fewer bands from a single service provider to a relatively small area, similar to a Wi-Fi access point. The benefits of small cell technologies are becoming increasingly important with the trend towards mobility in the enterprise market.

Strategy

We believe consumer demand for bandwidth, competition among operators and continuous technology advancements are driving communication network deployments and investment. We believe these trends position us for future growth and value creation because of our leading positions across diverse and growing market segments and geographies, our platform of innovative solutions, complementary market opportunities and our strong financial profile. We see growth opportunities in the markets we serve, and it is our plan to capitalize on these opportunities by providing our customers with products that can transform their networks with efficient solutions that optimize network performance and deployment speed. Our strategy and 2019 priorities are to:

Become a Preferred Partner to Our Customers

We plan to expand our industry leadership positions in fiber and wireless by developing and enhancing value-creating partner relationships with our customers, suppliers and distributors as well as our channel and technology partners.

We intend to expand these relationships by innovating, collaborating and selling with our customers. We expect to meet our commitments and maintain our product quality while collaborating with our customers to provide solutions to their key network challenges.

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Relentlessly Focus on Innovation to Solve Critical Problems

We plan to build on our legacy of innovation and on our worldwide portfolio of patents and patent applications by continuing to invest in research and development. We also intend to utilize our deep industry expertise to offer unique perspectives to solve customers' challenges. We intend to focus our investment on high growth markets.

Enhance Sales Growth

We expect to capitalize on our technology leadership, operational excellence, scale, market position, broad product offerings and quality to generate growth opportunities by:

- **Differentiating with speed.** We intend to make it easier for customers to do business with CommScope by improving our business velocity related to decisions, delivery, sales and customer service.

- **Enabling growth.** We intend to drive organic sales growth by refocusing on key markets and developing processes and tools to turn new ideas into growth.

- **Continuing to drive solutions offerings.** We intend to focus on selling solutions to our customers that align with their evolving needs, thereby enhancing our position as a strategic partner. With the addition of our high-speed migration portfolio and quick-turn delivery capabilities, we have broadened our range of solutions.

- **Making strategic acquisitions.** We expect to continue our disciplined approach to evaluating, executing and successfully integrating strategic acquisitions.

Expand Culture of Excellence

We strive to be viewed as a top employment destination where premier talent is hired, developed and retained. We also intend to make high-performance and operational excellence the standard throughout the Company while prioritizing collaboration and zero-tolerance for quality issues.

Continue to Enhance Operational Efficiency and Cash Flow Generation

We continuously pursue strategic initiatives aimed at optimizing our resources by reducing manufacturing and distribution costs and lowering our overall cost structure. We believe that we have a strong track record of improving operational efficiency and successfully executing on formalized profit improvement plans, cost-savings initiatives and working capital improvements to drive future profitability and cash flows. We intend to use the cash we generate to invest in our business to make strategic acquisitions and reduce our indebtedness.

ARRIS Acquisition Rationale

CommScope and ARRIS will each bring a unique set of complementary assets and capabilities that together can enable end-to-end wired and wireless communications infrastructure solutions that neither company could otherwise achieve on its own. The acquisition of ARRIS is expected to help us access new and growing markets, and have technology, solutions and employee talent that can provide additional value and benefit to our customers and partners.

We believe that the combined company can drive profitable growth in new markets, shape the future of wired and wireless communications, and position the new company to benefit from key industry trends, including network convergence, fiber and mobility everywhere, 5G, IoT, and rapidly changing network and technology architectures.

This transaction is a critical step in fueling growth, stockholder value and customer benefits and we believe the combined company will:

• Be positioned to capitalize on positive industry trends. The combined company is expected to be well positioned to benefit from key industry trends by combining best-in-class capabilities in network access technology and infrastructure and creating end-to-end, comprehensive solutions. Trends such as network convergence, fiber and mobility everywhere, the advent of 5G and fixed wireless access, IoT, and rapidly changing network and technology architectures are expected to provide compelling long-term opportunities for the combined company and its unique end-to-end communications infrastructure capabilities.

• Unlock significant, high-growth segments and increase product addressable market. The company expects to significantly increase its total product addressable market, with a unique set of complementary assets and capabilities that enable end-to-end communications infrastructure solutions such as:

• Converged small cell solutions for licensed and unlicensed wireless spectrum

• Complementary wired and wireless communications infrastructure

• Integrated broadband access

• Private network solutions for industrial settings, enterprises and public venues

• Comprehensive connected and smart home solutions

• Have expanded product offerings and R&D capabilities to meet diversified customer base. CommScope and ARRIS will share strong technical expertise with approximately 15,000 patents and approximately \$800 million in combined 2018 research and development investments. The combined company is expected to have a strong global footprint, serving customers across more than 100 countries.

• Have a broad product portfolio delivering end-to-end communication solutions. ARRIS operates in three reporting segments:

• Customer Premises Equipment (CPE) – The CPE segment’s product solutions include set-top boxes, gateways and subscriber premises equipment that enable service providers to offer voice, video and high-speed data services to residential and business subscribers.

• Network & Cloud (N&C) – The N&C segment’s product solutions include cable modem termination systems, video infrastructure, distribution and transmission equipment and cloud solutions that enable facility-based service providers to construct state-of-the-art residential and metro distribution networks. The portfolio also includes a full suite of global services that offer technical support, professional services and system integration offerings to enable solutions sales of ARRIS’s end-to-end product portfolio.

• Enterprise Networks (Enterprise) – The Enterprise segment focuses on enabling constant, wireless and wired connectivity across complex and varied networking environments. It offers dedicated engineering, sales and marketing resources to serve customers across a spectrum of enterprises—including hospitality, education, smart cities, government, event venues, service providers and more. Through its Ruckus brand, the Enterprise segment offers solutions like campus network switches, Wi-Fi access points, smart wireless services and software, system management and control solutions.

With the acquisition of the CPE, N&C and Enterprise businesses, we will have a product portfolio capable of delivering end-to-end communication solutions to our customers around the world. The ARRIS acquisition will provide us with opportunities for both new integrated product offerings as well as new use cases to address customer demands in an evolving industry landscape.

Have a strong financial profile with cost savings opportunities. On a pro forma basis for the year ended December 31, 2018, the combined company would have generated net revenues of approximately \$11.3 billion. As a result of the combined company’s increased scale, we expect to achieve annual run-rate cost savings of approximately \$150 million within three years post-close, with synergies of approximately \$60 million realized by the first year and approximately \$125 million by the second year. These cost savings are expected to be driven from synergies primarily in SG&A, logistics and procurement.

Generate significant cash and pay down debt. Given the increased scale and cash flow generation, as well as both companies’ track records of successful integration, we expect to be in a position to de-lever rapidly.

Operating Segments

We report financial performance based on two operating segments: CommScope Connectivity Solutions (CCS) and CommScope Mobility Solutions (CMS).

The distribution of net revenues between our two segments is as follows:

	Year Ended		
	December 31,		
	2018	2017	2016
CCS	61.6 %	61.6 %	60.2 %
CMS	38.4	38.4	39.8
Total	100.0%	100.0%	100.0%

CommScope Connectivity Solutions Segment

The CCS segment provides innovative fiber optic and copper cable and connectivity solutions for use in data centers and business enterprise, telecommunications, cable television and residential broadband networks. Our CCS portfolio includes innovative network solutions for indoor and outdoor network applications. Indoor network solutions, which account for slightly over half of CCS net sales, are found in commercial buildings and data centers. Our outdoor network solutions are found in local area and wide-area networks, central offices and headends and “last-mile” fiber-to-the-home (FTTH) installations. Fiber optic solutions account for slightly less than half of CCS net sales.

Indoor Connectivity Solutions (primarily Enterprise – including Hyperscale and Cloud Data Centers)

We have a leading global market position in enterprise connectivity for data centers and commercial buildings. Our solutions support mission-critical, high bandwidth applications. We integrate our structured cabling, connectors, in-building cellular solutions and network intelligence capabilities to create physical layer solutions that enable voice, video and data communication and building automation. We use proprietary modeling and simulation techniques to optimize networks to provide performance that exceeds established standards. In August 2017, we acquired Cable Exchange, a quick-turn supplier of fiber optic and copper assemblies for data, voice and video communication. Through our Cable Exchange acquisition, we have expanded our capabilities and presence in the hyperscale and cloud data center market. Our global network of partners offers custom, turnkey network solutions that are tailored to each customer’s unique requirements. Data centers and other fiber solutions account for nearly one-third of indoor network solutions net sales.

We believe that our strong market position results from our differentiated technology, long-standing relationships with customers and channel partners, strong brand recognition, premium product features and the performance and reliability of our solutions. These comprehensive solutions, sold primarily under the SYSTIMAX, NETCONNECT and Uniprise brands, include optical fiber and twisted pair structured cable solutions, intelligent infrastructure

management hardware and software, and network rack and cabinet enclosures.

Our data center solutions include a robust portfolio of high-density fiber optic connectivity, including shelves/panels, modules, trunks, jumpers/arrays and cable. We also offer fiber management systems, patch cords and panels, pre-terminated fiber connectivity, complete cabling systems, and cable assemblies for use in offices and data centers. These connectivity solutions can deliver data speeds of more than 100 gigabits per second (Gbps).

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Outdoor Connectivity Solutions (Service Provider)

We have a leading global position in providing fiber optic and coaxial cable solutions that support the multichannel video, voice and high-speed data services provided by telecommunications operators and MSOs. We provide a broad portfolio of connectivity solutions including FTTH equipment. Our fiber optic connectivity solutions are primarily comprised of hardened connector systems, fiber distribution hubs and management systems, couplers and splitters, plug and play multipoint service terminals, hardened optical terminating enclosures, high density cable assemblies, optical distribution frames and splice closures. These products are used in both local-area and wide-area networks, central offices and headends and “last-mile” FTTH installations, including deployments of fiber-to-the-node (FTTN), fiber-to-the-premises (FTTP) and fiber-to-the-distribution point (FTTdP) to homes, businesses and cell sites. These networks use the capabilities of fiber to enable consumers access to content at higher speeds and faster response times.

Our customers are pushing fiber deeper into their networks. They are investing in broadband to deliver higher-speed data to homes and businesses; fiber to macro cell towers, metro cells and small cells; and enabling network virtualization in wireless networks. These networks are capital intensive with a high portion of deployment costs related to labor in the field. We are focused on enabling solutions for our customers to build an effective and efficient FTTX network. With our technological capabilities and diverse fiber connectivity portfolio, we can help operators lower capital expenditures and reduce the total cost of ownership by creating solutions that shift labor from the field to the factory. While the timing of cable and connectivity deployments can be difficult to predict, we have a broad, technologically-advanced FTTX connectivity portfolio which we believe positions us to capitalize on the expected growth in fiber networks.

CommScope Mobility Solutions Segment

The CMS segment provides the integral building blocks for cellular base station sites and related connectivity; indoor, small cell and distributed antenna wireless systems; and wireless network backhaul planning and optimization products and services. Our macro cell site solutions can be found at wireless tower sites and on rooftops. Our metro cell solutions can be found on street poles and on other urban structures. Macro and metro cell site applications represent approximately 85% of our CMS segment net sales. Our DAS and small cell solutions allow wireless operators to increase spectral efficiency and enhance cellular coverage and capacity in challenging network conditions such as commercial buildings, urban areas, stadiums and transportation systems.

Our solutions, marketed primarily under the Andrew brand, enable wireless operators to meet coverage and capacity requirements for next generation networks. We focus our physical-layer solutions on all aspects of the Radio Access Network (RAN) from the macro through the metro, to the indoor layer. Our macro cell site, metro cell site, DAS and small cell solutions establish us as a global leader in RF infrastructure solutions for wireless operators and original equipment manufacturers (OEMs). We strive to provide a one-stop source for managing the technology lifecycle of a wireless network, including complete physical layer infrastructure solutions for 2G, 3G, 4G and 5G applications. In preparation for 5G networks, we continue to invest heavily in relevant research and development, support customer technology trials and actively participate in industry forums to help shape 5G standards. Our comprehensive solutions include products for every major wireless protocol and allow wireless network operators to operate across multiple frequency bands, reduce cost, achieve faster data rates, improve network response time and accelerate migration to the latest wireless technologies. Our wireless solutions are built using a modular approach, which has allowed us to leverage our core technology across generations of networks and mitigate technology risk. We provide a complete portfolio of RF infrastructure products, and we are recognized for our leading technologies, best-in-class performance, comprehensive product portfolio and global scale.

Our macro cell site solutions include base station antennas, microwave antennas, hybrid fiber-feeder and power cables, coaxial cables, connectors and filters. We also provide a comprehensive portfolio at the base of the tower including cabinets, platforms, fiber backhaul connectivity hubs and power solutions that allow operators to minimize capital expenditures, operating expenses and deployment time.

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Our metro cell solutions include RF delivery, equipment, housing and concealment. The fully integrated outdoor systems include specialized antennas, filters/combiners, backhaul solutions, intra-system cabling and power distribution, all minimized to fit an urban environment. These solutions facilitate site acquisition and improve RF network performance in the metro area while minimizing interference with the macro layer. Furthermore, they enable faster zoning approvals and expedite construction.

Our small cell and DAS solutions are primarily comprised of distributed antenna systems and distributed cell solutions. The combination of our innovative small cell offerings and our industry-leading DAS portfolio enables us to provide a broader range of solutions, addressing single-operator, single-band, low capacity environments all the way through multi-carrier, multi-technology, multi-band, high capacity environments.

Manufacturing and Distribution

We develop, design, fabricate, manufacture and assemble many of our products and solutions in-house at our facilities located around the world. We have strategically located our manufacturing and distribution facilities to provide superior service levels to customers. We utilize lower-cost geographies for high labor content products while investing in largely automated plants in higher-cost regions close to customers. Most of our manufacturing employees are located in lower-cost geographies such as Mexico, China, India and the Czech Republic. We continually evaluate and adjust operations to improve service, lower cost and improve the return on our capital investments. In addition, we utilize contract manufacturers for many of our product groups, including certain cabinets and filter products. We expect to continue modifying global operations to adapt to changing product demand or business conditions.

Research and Development

Research and development is important to preserve and expand our position as a market leader and to provide the most technologically advanced solutions in the marketplace. We invested \$186 million in research and development during 2018 and expect to continue with substantial investments in future years. We continue to focus our major research and development activities on high-growth opportunities such as fiber optic connectivity for FTTX and data centers, active and passive base-station antennas, and metro cell and small cell wireless solutions. We are also in the process of developing solutions that support the convergence of wireline and wireless networks in preparation for 5G. Several of our professionals are leaders and active contributors in standards-setting organizations which helps ensure that our products can be formulated to achieve broad market acceptance.

Customers

Our customers include substantially all of the leading global telecom operators, data center managers, leading cable television providers or MSOs and thousands of enterprise customers, including many Fortune 500 companies, which we serve both directly and indirectly. Major customers and distributors include companies such as Anixter International Inc.; AT&T Inc.; Charter Communications, Inc.; Comcast Corporation; Ericsson, Inc.; Graybar Electric Company, Inc.; KGP Co; Talley Inc.; T-Mobile; Verizon Communications Inc.; and Wesco International Inc. We support our global sales organization with regional service centers strategically located around the world.

Products from our CCS segment are primarily sold indirectly to the end customer through independent distributors, system integrators or value-added resellers. We also sell directly to cable television system operators, broadband operators, or service providers that deploy broadband networks. Sales to our top three CCS segment customers represented 17% and 18% of our consolidated net sales for the years ended December 31, 2018 and 2017, respectively. Net sales to our largest customer, Anixter International Inc. and its affiliates (Anixter), accounted for 11% of our consolidated net sales for each of the years ended December 31, 2018 and 2017. No other CCS segment customers accounted for 10% or more of our consolidated net sales for the years ended December 31, 2018 or 2017.

Products from our CMS segment are primarily sold to wireless operators, integrators or contractors that deploy elements of wireless networks at the direction of wireless operators or OEMs that sell equipment to wireless operators. Our customer service and engineering groups maintain close working relationships with these customers due to the significant amount of customization associated with some of these products. Direct sales to our top three CMS segment operator customers represented 11% and 13% of our consolidated net sales for the years ended December 31, 2018 and 2017, respectively. No CMS segment customer accounted for 10% or more of our consolidated net sales for the years ended December 31, 2018 and 2017. While we sell to most wireless operators globally, our sales are concentrated within a small number of large operators.

We generally have no minimum purchase commitments with any of our distributors, system integrators, value-added resellers, wireless operators or OEM customers, and our contracts with these parties do not prohibit them from purchasing or offering products or services that compete with ours. Although we maintain long-term relationships with these parties and have not historically lost key customers, we have experienced variability in the level of purchases by our key customers. Any significant reduction in sales to these customers, including as a result of the inability or unwillingness of these customers to continue purchasing our products, could materially and adversely affect our business, financial condition, results of operations and cash flows. See Part I, Item 1A, "Risk Factors."

We employ a global manufacturing and distribution strategy to control production costs and provide world-class service to customers. We support our international sales efforts with sales representatives based in Europe, Latin America, Asia and other regions throughout the world. Our net sales from international operations were \$2.0 billion, \$2.1 billion and \$2.3 billion for the years ended December 31, 2018, 2017 and 2016, respectively.

Patents and Trademarks

We pursue an active policy of seeking intellectual property protection, including patents and registered trademarks, for new products and designs. On a worldwide basis, we held approximately 9,500 patents and patent applications and approximately 2,300 registered trademarks and trademark applications as of December 31, 2018. We consider our patents and trademarks to be valuable assets, and while no single patent is material to our overall operations, we believe the CommScope, Andrew, SYSTIMAX, HELIAX and NETCONNECT trade names and related trademarks are critical assets to our business. We intend to rely on our intellectual property rights, including our proprietary knowledge, trade secrets and continuing technological innovation, to develop and maintain our competitive position. We will continue to protect our key intellectual property rights.

Backlog and Seasonality

At December 31, 2018 and 2017 we had an order backlog of \$500 million and \$492 million, respectively. Orders typically fluctuate from quarter to quarter based on customer demand and general business conditions. Our backlog includes only orders that are believed to be firm. Sometimes, unfilled orders may be canceled prior to shipment of goods, but cancellations historically have not been material. However, our current order backlog may not guarantee future demand.

Due to the variability of shipments under large contracts, customers' seasonal installation considerations and variations in product mix and in profitability of individual orders, we can experience significant quarterly fluctuations in sales and operating income. Our operating performance is typically weaker during the first and fourth quarters and stronger during the second and third quarters. These variations are expected to continue in the future. It may be more meaningful to focus on annual rather than interim results.

Competition

The market for our products is highly competitive and subject to rapid technological change. We encounter significant domestic and international competition across both segments of our business. Our competitors include large, diversified companies — some of whom have substantially more assets and greater financial resources than we do. We also face competition from small to medium-sized companies and less diversified companies that have concentrated efforts in one or more areas of the markets we serve. Our competitors include AFL (a subsidiary of Fujikura, Ltd.); Amphenol Corporation; Belden Inc.; Berk-Tek (a Company of Nexans S.A.); Comba Telecom Systems Holding Ltd.; Corning Incorporated; Emerson Electric Co.; Ericsson Inc.; Huawei Technologies Co., Ltd.; JMA Wireless; KATHREIN-Werke KG; Leviton Manufacturing Co., Inc.; Nokia Corp; Ortronics (a brand of Legrand NA, LLC); Panduit Corp.; RFS (a subsidiary of Nokia Corp); SOLiD Technologies; Sumitomo Corp; and ZTE Corp. We compete primarily on the basis of delivering solutions, product specifications, quality, price, customer service and delivery time. We believe that we differentiate ourselves in many of our markets based on our market leadership, global sales channels, intellectual property, strong reputation with our customer base, the scope of our product offering, the quality and performance of our solutions, and our service and technical support.

Competitive Strengths

We are a global leader in connectivity and essential infrastructure solutions for communications networks, and we believe we hold leading market positions in our segments. Since our founding in 1976, CommScope has been a leading brand in connectivity solutions for communications networks. In the wireless industry, Andrew is one of the world's most recognized brands and a global leader in RF solutions for wireless networks. In the enterprise market, SYSTIMAX, NETCONNECT and Uniprise are recognized as global market leaders in enterprise connectivity solutions for business enterprise and data center applications.

We believe the following competitive strengths have been instrumental to our success and position us well for future growth and strong financial performance:

Differentiated Solutions Supported by Ongoing Innovation and Significant Proprietary Intellectual Property (IP)

Our integrated solutions for wireless, enterprise, fiber optic and broadband networks are differentiated in the marketplace and are a significant global competitive advantage. We invested \$186 million in research and development during 2018 and expect to continue with substantial investments in future years. We have also added significant IP and innovation through acquisitions, such as the acquisition of Broadband Network Solutions (BNS) from TE Connectivity, which added approximately 7,000 patents and patent applications worldwide and gave us access to leading fiber technology that will help us better address a transition to fiber deployments deeper into networks and data centers as consumers and businesses generate increasing bandwidth requirements; Airvana, which expanded our leadership and capabilities in providing indoor wireless capacity and coverage; and Argus Technologies (Argus), which enhanced our next-generation base station antenna technology. Our ongoing innovation, supported by proprietary IP and technology know-how, has allowed us to sustain this competitive advantage. With these new innovative solutions, we expect to solve more customer communications challenges, while providing greater opportunities to our business partners.

Integrated solutions. Our wireless network offerings include complete connectivity solutions supporting 2G, 3G and 4G wireless technologies for both macro and metro, as well as DAS and small cell sites. We are also developing solutions that support the convergence of wireline and wireless networks in preparation for 5G. We provide a complete portfolio of integrated RF solutions from the output of the base station (or baseband processor) at the bottom of the tower to the antenna at the top of the tower. In the enterprise and data center markets, we deliver a comprehensive solution including connectivity and cables, enclosures and network intelligence software. In the

FTTX market, we offer end-to-end solutions including connectors, cabling, splice closures and fiber management systems. Our ability to provide integrated connectivity solutions for wireless, enterprise, fiber optic and broadband networks makes us a value-added solutions provider to our customers and gives us a significant competitive advantage.

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Strong design capabilities and technology know-how. We have a long tradition of developing highly engineered connectivity solutions, demonstrating superior performance across various generations of networks. Our ongoing focus on engineering innovation has enabled us to create high quality products that are reliable, have a desirable form factor and enable our customers to optimize the performance, flexibility, installation time, energy consumption and space requirements of their network deployments.

Significant proprietary IP. Our proven record of innovation and decades of experience creating market-leading technology products are evidenced by our approximately 9,500 patents and patent applications, as well as our approximately 2,300 registered trademarks and trademark applications, worldwide. Our significant proprietary IP, when combined with our deep engineering expertise, allows us to create industry defining solutions for customers around the world.

Established Sales Channels and Customer Relationships

We serve customers in over 100 countries and have become a trusted advisor to many of them through our industry expertise, quality products, leading technology and long-term relationships. These factors enable us to provide mission-critical connectivity solutions that our customers need to build high-performing communication networks.

Our customers include substantially all of the leading global telecom operators, data center managers, leading cable television providers or MSOs and thousands of enterprise customers, including many Fortune 500 companies. We are a key supplier within the wireless infrastructure market and enjoy established sales channels across all geographies and technologies. Our long-standing relationships with telecommunication operators enable us to work closely with them in providing highly customized solutions aligned with their technology roadmaps. We have a global sales force with sales representatives based in North America, Europe, Latin America, Asia and other regions, and an extensive global network of channel partners including independent distributors, system integrators and value-added resellers. Our sales force has direct relationships with our customers and end users which generates demand for our products, with a large portion of our sales fulfilled through channel partners. Our direct sales force and channel partner relationships give us extensive reach and distribution capabilities to customers globally.

Global Scale, Manufacturing Footprint and Quality

Our global manufacturing and distribution footprint and worldwide sales force give us significant scale within our addressable markets. We believe our scale, stability and quality make us an attractive strategic partner to our large global customers, and we have been repeatedly recognized by key customers for these attributes. In addition, our ability to leverage our core competencies across our business, coupled with our successful track record of operational efficiencies, has allowed us to improve our margins and cash flows over time while continuing to invest in research and development and acquisitions targeting new products and markets.

Our manufacturing and distribution facilities are strategically located to optimize service levels and product delivery times. We also utilize lower-cost geographies for high labor content products and largely automated plants in higher-cost regions. Over half of our manufacturing employees are in lower-cost geographies such as Mexico, China, India and the Czech Republic. Our dynamic manufacturing and distribution organization allows us to:

- Flex our capacity to meet market demand and expand our market position;
- Deliver high-quality customer solutions;
- Provide high customer service levels due to proximity to the customer; and
- Effectively integrate acquisitions and capitalize on related synergies.

Proven Management Team with Record of Operational Excellence and Successful M&A Integration

We have a strong track record of organically growing market share, establishing leadership positions in new markets, managing cash flows, delivering profitable growth across multiple economic cycles and integrating large and small

acquisitions. Our senior management team has extensive experience in connectivity solutions for the communications infrastructure industry.

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We have a history of strong operating cash flow and have generated over \$1.7 billion in cumulative operating cash flow over the last three years. Our strong cash flow profile has allowed us to continue to invest in innovative research and development, pursue strategic acquisitions, repay debt and return cash to stockholders. We continuously pursue strategic initiatives aimed at optimizing our resources, reducing manufacturing and distribution costs and lowering our overall cost structure.

Throughout our history, we have successfully complemented our organic growth with strategic acquisitions. We have completed the BNS business integration and we have delivered substantial synergies, completed significant system integrations and re-organized the business. Our management team has effectively integrated other large acquisitions, such as Andrew Corporation in 2007 and Avaya Connectivity Solutions in 2004. We have also executed tuck-in acquisitions, such as Cable Exchange, Airvana, Argus and Alifabs, to help expand our market opportunities and continue to solve our customers' business challenges in multiple growth areas. We expect the acquisition of ARRIS to accelerate our strategy to drive profitable growth by unlocking high growth markets, increasing the product addressable market and position the combined company to capitalize on key industry trends as a leading global communication infrastructure provider.

Raw Materials

Our products are manufactured or assembled from both standard components and parts that are unique to our specifications. Our internal manufacturing operations are largely process oriented and we use significant quantities of various raw materials, including aluminum, bimetals, brass, copper, plastics and other polymers, optical fiber and steel, among others. We use significant volumes of copper, aluminum, steel and polymers in manufacturing coaxial and twisted pair cables and antennas. Other parts are produced using processes such as stamping, machining, molding and pressing from metals or plastics. Portions of the requirements for these materials are purchased under supply arrangements where some portion of the unit pricing may be indexed to commodity market prices for these metals. We may occasionally enter forward purchase commitments or otherwise secure availability for specific commodities to mitigate our exposure to price changes for a portion of our anticipated purchases. Certain of the raw materials utilized in our products may only be available from a few suppliers, and we may enter into longer term agreements to secure access to certain key inputs. We may, therefore, encounter availability issues and/or significant price increases.

Our profitability may be materially affected by changes in the market price of our raw materials, most of which are linked to the commodity markets. Prices for aluminum, copper, plastics and certain other polymers derived from oil and natural gas have fluctuated substantially during the past several years. We have adjusted our prices for certain products and may have to adjust prices again. Delays in implementing price increases, failure to achieve market acceptance of price increases, or price reductions in response to a rapid decline in raw material costs, could have a material adverse impact on the results of our operations.

In addition, some of our products are assembled from specialized components and subassemblies manufactured by suppliers. We depend upon sole suppliers for certain key components for some of our products. If these sources could not provide these components in sufficient quantity and quality on a timely and cost efficient basis, it could materially impact our results of operations until another qualified supplier is found. We believe that our supply contracts and our supplier contingency plans mitigate some of this risk.

Environment

We are subject to various federal, state, local and foreign environmental laws and regulations governing, among other things, discharges to air and water, management of regulated materials, handling and disposal of solid and hazardous waste, and investigation and remediation of contaminated sites. In addition, we are or may be subject to laws and regulations regarding the types of substances allowable in certain of our products and the handling of our products at

the end of their useful life. See Part I, Item 1A, “Risk Factors” for additional discussion of our risks related to environmental laws and regulations.

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Employees

As of December 31, 2018, we had a team of over 20,000 people to serve our customers worldwide. The majority of our employees are located outside of the United States (U.S.). As a matter of policy, we seek to maintain good relations with our employees at all locations. We are not subject to any collective bargaining agreements in the U.S. A significant portion of our international employees are members of unions or subject to workers' councils or similar statutory arrangements. From a companywide perspective, we believe that our relations with our employees and unions or workers' councils are satisfactory, though we have experienced challenges in certain countries and may encounter more such challenges. Historically, periods of labor unrest or work stoppage have not had a material impact on our operations or results.

Available Information

Our website (www.commscope.com) contains frequently updated information about us and our operations. Our filings with the Securities and Exchange Commission (SEC) on Form 10-K, Form 10-Q, Form 8-K and Proxy Statements and all amendments to those reports can be viewed and downloaded free of charge as soon as reasonably practicable after the reports and amendments are electronically filed with or furnished to the SEC by accessing www.commscope.com and clicking on Company, Investor Relations, Financial Information and then clicking on SEC Filings. The information contained on or incorporated by reference to our website is not a part of this Annual Report on Form 10-K.

ITEM 1A. RISK FACTORS

The following is a cautionary discussion of risks, uncertainties and assumptions that we believe are significant to our business. In addition to the factors discussed elsewhere in this Annual Report on Form 10-K, the following are some of the important factors that, individually or in the aggregate, we believe could make our results differ materially from those described in any forward-looking statements. It is impossible to predict or identify all such factors and, as a result, you should not consider the following factors to be a complete discussion of risks, uncertainties and assumptions related to us or our business.

ARRIS Acquisition Risks

The pending acquisition of ARRIS International plc (ARRIS) (the Pending Acquisition) may not be completed on a timely basis, on anticipated terms, or at all, and there are uncertainties and risks to consummating the Pending Acquisition.

The obligation of each party to consummate the Pending Acquisition is subject to the satisfaction of a number of conditions set forth in the bid conduct agreement, as amended (the Bid Conduct Agreement) dated November 8, 2018, many of which are not within our control. Several conditions have been satisfied such as approval of the acquisition by the ARRIS stockholders and expiration of the Hart-Scott Rodino Act waiting period in the U.S. Other conditions that still need to be satisfied include the receipt of all remaining required consents, approvals or clearances required by certain other foreign governmental authorities under applicable antitrust laws and the absence of any legal restraint that prohibits the Pending Acquisition. Each party's obligation to consummate the Pending Acquisition is subject to certain additional closing conditions, including the accuracy of representations and warranties and performance of each parties' obligations required to be performed as well as others set forth in the Bid Conduct Agreement. The failure to satisfy all of the required conditions could delay the completion of the Pending Acquisition for a significant period of time or prevent it from occurring. Any delay in completing the Pending Acquisition, including as a result of any litigation related to the Pending Acquisition, could prevent us from realizing some or all of the benefits that we expect to achieve. Furthermore, subject to certain conditions, ARRIS may at any time terminate the Bid Conduct Agreement as a result of a superior proposal to purchase its business.

We face risks and uncertainties due to the announcement of the Pending Acquisition, as well as the potential failure to consummate the Pending Acquisition, including that:

- CommScope does not currently control ARRIS, and will not control ARRIS until completion of the acquisition, and until that time there can be no assurance that ARRIS will be operated in the same way it would under CommScope's control;
- the Pending Acquisition could have an adverse impact on our relationships with employees, customers and suppliers, and prospective customers or other third parties may delay or decline entering into agreements with us as a result of the announcement, whether or not the Pending Acquisition is consummated;
- we incur significant transaction costs, including legal, financial advisory, accounting and other costs relating to the Pending Acquisition, even if it is not consummated, and any delay in consummation of the Pending Acquisition may increase these costs;
- we have incurred significant indebtedness to fund the Pending Acquisition, and even if the Pending Acquisition is not consummated and we do not utilize the proceeds, we are required to pay interest or ticking fees until the Pending Acquisition is terminated;
- the attention of our management and employees may be diverted from pursuing other opportunities or running day-to-day operations;
- if the Pending Acquisition is not consummated, we will not realize any of the expected benefits of the Pending Acquisition;

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failure to consummate the Pending Acquisition could result in negative reactions from the financial markets or in the investment community, including negative impacts on our stock price;

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- we may be subject to shareholder litigation related to the Pending Acquisition or failure to complete the Pending Acquisition; and
- if the Bid Conduct Agreement is terminated before we complete the Pending Acquisition, under some circumstances, including in the event CommScope fails to obtain the required antitrust approvals or is unable to secure the financing necessary to consummate the Pending Acquisition, CommScope may have to pay a termination fee to ARRIS of \$250.0 million in cash.

The occurrence of any of these events, individually or in combination, could have a material adverse effect on our business, financial position, results of operations and cash flows.

The integration of CommScope and ARRIS will be difficult, costly and time-consuming and the anticipated benefits and cost savings may take longer to realize than expected or may not be realized at all. If we are unable to integrate ARRIS effectively, we may not realize the anticipated benefits of the Pending Acquisition.

We currently expect to realize annual synergies and cost savings of approximately \$150.0 million to be fully achieved within three years of the closing of the Pending Acquisition, with approximately \$60.0 million in the first full year. We also expect to incur integration and restructuring costs of approximately \$150.0 million to achieve these synergies. These synergies are expected to come from all areas of our company, including sales, marketing, general and administrative, operations and research and development. Our ability to realize the anticipated benefits is dependent, to a large extent, on our ability to complete the integration of the two businesses. The combination of two independent businesses is a complex, costly and time-consuming process and there can be no assurance that we will be able to successfully integrate CommScope and ARRIS, or if such integration is successfully accomplished, that such integration will not be more costly or take longer than presently contemplated. If we cannot successfully complete the integration within a reasonable time frame, we may not be able to realize the anticipated benefits of the Pending Acquisition, which could have a material adverse effect on our share price, business, financial position, results of operations and cash flows.

Our ability to realize the expected synergies and benefits of the Pending Acquisition is subject to a number of risks and uncertainties, many of which are outside of our control. These risks and uncertainties include, among other things:

- the completion of an effective integration of operations, controls, policies and procedures, and technologies, as well as the harmonization of differences in the business cultures of CommScope and ARRIS;
- the diversion of management attention from ongoing operation of our business as well as ARRIS' business during the integration;
- our ability to retain the service of senior management and other key personnel of both CommScope and ARRIS;
- our ability to preserve customer, supplier and other important relationships of CommScope and ARRIS and resolve potential conflicts that may arise;
- the risk that certain of CommScope's or ARRIS' customers and suppliers will opt to discontinue business with CommScope or ARRIS or exercise their right to terminate agreements as a result of the Acquisition pursuant to change of control provisions in these agreements or otherwise;
- the risk that ARRIS may have liabilities we failed to or were unable to discover in the course of performing due diligence;
- integrating CommScope's and ARRIS' various information systems, including different enterprise resource planning systems, will be complex and challenging and may result in production disruptions or be more costly than anticipated;
- the risk that integrating ARRIS' workforce into the CommScope workforce may result in production or other disruptions or be more costly than anticipated;

- greater than expected difficulties in achieving anticipated cost savings, synergies, business opportunities and growth prospects from the combination; and
- greater than expected difficulties in managing the expanded operations of a significantly larger and more complex combined business.

As a result of the Pending Acquisition, The Carlyle Group (Carlyle) will own a substantial portion of our equity and its interests may not be aligned with yours.

Funding for the Pending Acquisition will include a convertible preferred stock investment by Carlyle. As a result, Carlyle will own approximately 16% of our common stock on an as-converted basis and we will increase the size of our board of directors to eleven, giving Carlyle the right to designate up to two directors. In addition, certain of our existing directors are senior advisors to Carlyle. Circumstances may occur in which the interests of Carlyle could conflict with the interests of our other stockholders. For example, the existence of Carlyle as a significant stockholder and Carlyle's board appointment rights may have the effect of deterring hostile takeovers, delaying or preventing changes in control or changes in management or limiting the ability of our other stockholders to approve transactions that they may deem to be in the best interests of our company.

Competitive Risks

Our business is dependent on capital spending for data and communication networks, and reductions in such capital spending could adversely affect our business.

Our performance is dependent on capital spending for constructing, rebuilding, maintaining or upgrading data and communication networks, which can be volatile and difficult to forecast. Capital spending in the communications industry is cyclical and can be curtailed or deferred on short notice. A variety of factors affect the timing and amount of capital spending in the communications industry including: competing technologies; general economic conditions; seasonality of outside deployments; timing and adoption of the global rollout of new technologies; customer specific financial or general market conditions; changes in customer preferences or requirements; availability and cost of capital; governmental regulation; demands for network services; competitive pressures, including pricing pressures; acceptance of new services offered by our customers; industry consolidation; and real or perceived trends or uncertainties in these factors. As a result of these factors, we may not be able to maintain or increase our sales in the future, and our business, financial condition, results of operations and cash flows could be materially and adversely affected.

A substantial portion of our business is derived from a limited number of key customers and channel partners.

Our customer base includes direct customers, original equipment manufacturers (OEMs) and channel partners, which include distributors, system integrators and value-added resellers. We derived 18% of our 2018 consolidated net sales from our top two direct customers. Our largest customer, Anixter International Inc. (Anixter), accounted for 11% of our 2018 consolidated net sales. As a result of the Pending Acquisition, our customer concentration composition will likely change and our largest customer is expected to be Comcast Corporation with 10% or more of our total net sales.

The concentration of our net sales among key customers subjects us to a variety of risks including:

- lower sales that could result from the loss of one or more of our key customers;
- less efficient operations that could result in higher costs from an inability to accurately forecast and plan for volatile spending patterns of key customers;
- renegotiations of agreements with key customers (or consolidation of agreements with common customers in connection with the Pending Acquisition) that could result in materially less favorable terms;

- financial difficulties experienced by one or more of our key customers that could result in reduced purchases of our products and/or delays or difficulties in collecting accounts receivable balances; and reductions in inventory levels held by channel partners and OEMs, which may be unrelated to purchasing trends by end customers.

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We are also exposed to similar risks to the extent that we have significant indirect sales to one or more end-users of our products who may also be a direct customer.

We generally have no minimum purchase commitments with any of our distributors, system integrators, value-added resellers, operators or OEMs or other customers, and our contracts with these parties do not prohibit them from purchasing or offering products or services that compete with ours. Although we maintain long-term relationships with these parties and have not historically lost key customers, we have experienced variability in the level of purchases by our key customers. Any significant reduction in sales to these customers, including as a result of the inability or unwillingness of these customers to continue purchasing our products, could materially and adversely affect our business, financial condition, results of operations and cash flows.

We face competitive pressures with respect to all of our major product groups.

Competition in our industry depends on a number of factors, including innovative product and service solution offerings, the ability to adapt to changing markets and customer preferences, product and service quality, timing of the introduction of new products and services, speed of delivery, pricing, customer service and the total customer experience. In each of our major product groups, we compete with a substantial number of foreign and domestic companies, some of which have greater financial, technical, marketing and other resources or lower operating costs. They may also have broader product offerings and market focus. This gives many of these enterprises a competitive advantage to withstand any significant reduction in capital spending by customers in our markets over the long term. Further, our industry continues to consolidate, and the combination of any of our competitors could further increase these advantages and result in competitors with broader market presence.

Some competitors may be able to bundle their products and services together and may be capable of delivering more complete solutions than we are able to provide to better meet customer preferences, which may cause us to lose sales opportunities and revenue. Competitors' actions, such as price reductions, acceptance of higher-risk contractual terms, or the introduction of new innovative products and services, and the use of exclusively price driven auctions by customers have caused lost sales opportunities in the past and may cause us to lose sales opportunities in the future. The rapid technological changes occurring in the communications industry could also lead to the entry of new competitors against whom we may not be able to compete successfully. For example, as networks become more virtualized, our products may be at risk of being subsumed by competitors who provide software solutions that perform the same functionality as our products. In addition, if any of our competitors' products or technologies were to become the industry standard, our business would be negatively affected. Further, if we are unable to continue to transform our business processes to support changing customer expectations and deliver a superior total customer experience, we may lose sales opportunities in the future. Changes in trade policies could also decrease the price competitiveness of our products and/or increase our operating costs. For a more complete discussion of our risks related to trade policies, see the risk factor "Additional tariffs or a global trade war could increase the cost of our products, which could adversely impact the competitiveness of our products" under "International Risks" in this Item 1A. Risk Factors section.

We cannot assure you that we will continue to compete successfully with our existing competitors or with new competitors. If we are unable to compete in any of our markets at the same level as we have in the past or are forced to reduce the prices of our products in order to continue to be competitive, our operating results, financial condition and cash flows could be materially and adversely affected.

Changes to the regulatory environment in which our customers operate may negatively impact our business.

The telecommunications and cable television industries are subject to significant and changing federal and state regulation, both in the U.S. and other countries. We have benefited from government programs that encourage spending on initiatives that utilize our products. Changes to the way in which internet service providers are regulated, changes in government programs in our industry or uncertainty regarding future changes could adversely impact our customers' decisions regarding capital spending, which could decrease demand for our products. Decreased demand for our products could materially and adversely affect our operating results, financial condition and cash flows.

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Operational Risks

Our future success depends on our ability to anticipate and adapt to changes in technology and customer preferences and develop, implement and market innovative solutions.

Many of our markets are characterized by advances in information processing and communications capabilities that require increased transmission speeds and greater bandwidth. These advances require significant investments in research and development in order to improve the capabilities of our products and services and develop new offerings or solutions that will meet the needs and preferences of our customers. There can be no assurance that our investments in research and development will yield marketable product innovations.

We may not be successful in our ongoing innovation efforts if, among other things, our products and services are not cost effective; brought to market in a timely manner; compliant with evolving industry standards; accepted in the market; or recognized as meeting customer requirements. We could experience a material adverse effect on our results of operations, financial condition and cash flows if we are not successful in our ongoing innovation efforts.

As our products become more complex and customer preferences continue to change, we may encounter difficulties in meeting customer preferences including performance, service and delivery expectations, which could have a material adverse effect on our results of operations, financial condition and cash flows.

If we do not stay current with product life cycle developments, our business may suffer.

A significant portion of our revenues is dependent on the commercial deployment of technologies based on 3G and 4G wireless communications equipment and products. If we are not able to support our customers in an effective and cost-efficient manner as they advance from older generation networks or as they expand the capacity of their networks, our business will suffer. If we do not have competitively priced, market-accepted products available to meet our customers' planned roll-out of 5G wireless communications systems, we may miss a significant opportunity and our business, financial condition, results of operations and cash flows could be materially and adversely affected.

In addition, there are several major trends that we expect to continue to impact the enterprise market and product life cycles. Enterprises are shifting toward mobility indoors and adjusting in-building cabling designs to support Wi-Fi, more access points and in-building cellular applications. Due to significant increases in data traffic and migrations of applications to the cloud, enterprises are also shifting spending toward multi-tenant data centers and hyperscale cloud service providers, which offer cloud data centers services as a replacement to in-house corporate data centers. As a result, there is growing demand for fiber solutions and decelerating demand for copper solutions. If we are unable to continue to support customers in these transitions, or if sales of copper products decline faster than expected, we could experience a material adverse effect on our results of operations, financial condition and cash flows.

If our service offerings or products, including material purchased from our suppliers, have quality or performance issues, our business may suffer.

Our business depends on delivering products and services of consistently high quality. Many of our solutions are highly complex and testing procedures used by us and our customers are limited to evaluating them under likely and foreseeable failure scenarios. For various reasons, once deployed, our products may fail to perform as expected. Performance issues could result from faulty design, defective raw materials or components purchased from suppliers, problems in manufacturing or installation errors. We have experienced such performance issues in the past and remain exposed to such performance issues in the future. In some cases, recall of some or all affected products, product redesigns or additional capital expenditures may be required to correct a defect. In addition, we generally offer warranties on most products, the terms and conditions of which depend upon the product subject to the warranty. In

many cases, we also indemnify our customers against damages or losses that might arise from certain claims relating to our products and services. Future claims may have a material adverse effect on our business, financial condition, results of operations and cash flows. Any significant or systemic product or service failure could also result in lost future sales as well as reputational damage.

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Our business depends on effective management information systems.

We rely on effective management information systems for critical business operations, to support strategic business decisions and to maintain a competitive edge in the marketplace. We rely on our enterprise resource planning systems to support critical business operations such as processing sales orders and invoicing; manufacturing; shipping; inventory control; purchasing and supply chain management; human resources; and financial reporting. We also rely on management information systems to produce information for business decision-making and planning and to support e-commerce activities. Failure to maintain an adequate digital platform or to make additional investment in our digital platform to support e-commerce activities and improve our customer experience could have a material adverse impact on our business through lost sales opportunities.

If we are unable to maintain our management information systems, including our IT infrastructure, to support critical business operations, to produce information for business decision-making activities and to support our e-commerce activities, we could experience a material adverse impact on our business or an inability to timely and accurately report our financial results.

Cyber-security incidents, including data security breaches, ransomware or computer viruses, could harm our business by exposing us to various liabilities, disrupting our delivery of products and services and damaging our reputation.

We rely extensively on our management information technology systems and those of third parties to operate our business and store proprietary information about our products and intellectual property. Additionally, we and others acting on our behalf store “personally identifiable information” with respect to employees, vendors, customers and others. As the recent rise in cyber-security incidents around the world indicates, all management information technology systems are vulnerable. Despite the security controls we have in place, our facilities, systems and procedures, and those of our third-party service providers, are at risk to security breaches, acts of vandalism, ransomware, software viruses, misplaced or lost data, programming and/or human errors or other similar events. In particular, unauthorized access to our computer systems or stored data could result in the theft or improper disclosure of proprietary, confidential or sensitive information, the deletion or modification of records or interruptions in our operations. Any such events could subject us to civil and criminal penalties; expose us to liabilities to our customers, employees, vendors, governmental authorities or other third parties; allow others to unfairly compete with us; disrupt our delivery of products and services; and have a negative impact on our reputation, all of which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

There has been an increase in the adoption of laws and regulations in the U.S., Europe and elsewhere imposing requirements for the handling of personal data, as well as requirements for remediation actions and financial penalties for noncompliance. For example, we are subject to the European Union’s General Data Protection Regulation (GDPR), which took effect in May 2018. We employ a variety of security breach countermeasures and security controls that we believe are compliant, but we cannot guarantee that all breach attempts can be successfully thwarted by these measures as the sophistication of attacks increases. In addition, as the regulatory environment related to information security, data collection and use, and privacy becomes increasingly rigorous, with new and constantly changing requirements applicable to our business, compliance with those requirements could also result in additional costs. Noncompliance with laws and regulations related to cyber-security breaches could have negative consequences, including government investigations, penalties, fines, civil and criminal sanctions and reputational harm, and have an adverse effect on our business, financial condition, results of operations and cash flows.

If our integrated global manufacturing operations suffer production or shipping delays, we may have difficulty meeting customer demands.

Disruption of our ability to produce at or distribute from our facilities could adversely affect our ability to manufacture products at our other manufacturing facilities in a cost-effective and timely manner. In particular, some of our manufacturing facilities rely on aging production equipment and information technology infrastructure, and if we fail to properly maintain or update this equipment, it could affect our ability to manufacture or ship products. Other disruptions, including those due to failure of our manufacturing infrastructure, information technology outage, labor disturbances, fire, electrical outage, natural disaster, acts of violence or terrorism, shipping interruptions or some other catastrophic event could adversely affect our ability to manufacture products at our other manufacturing facilities in a cost-effective and timely manner, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Supply Chain Risks

Our dependence on commodities subjects us to cost volatility and potential availability constraints.

Our profitability may be materially affected by changes in the market price and availability of certain raw materials, most of which are linked to the commodity markets. The principal raw materials and components we purchase are made of metals such as copper, steel, aluminum or brass; plastics and other polymers; and optical fiber. Fabricated copper, steel and aluminum are used in the production of coaxial and twisted pair cables and polymers are used to insulate and protect cables. Prices for copper, steel, aluminum, fluoropolymers and certain other polymers derived from oil and natural gas have experienced significant volatility as a result of changes in the levels of global demand, supply disruptions and other factors. As a result, we have adjusted our prices for certain products and may have to adjust prices again in the future. Delays in implementing price increases or a failure to achieve market acceptance of price increases has in the past and could in the future have a material adverse impact on our results of operations. In an environment of falling commodities prices, we may be unable to sell higher-cost inventory before implementing price decreases, which could have a material adverse impact on our business, financial condition and results of operations.

We are dependent on a limited number of key suppliers for certain raw materials and components.

We are dependent on a limited number of key suppliers for certain of our raw material and component purchases, including certain polymers, copper rod, copper and aluminum tapes, fine aluminum wire, steel wire, optical fiber, circuit boards and other electronic components.

Our key suppliers have experienced in the past, and could experience in the future, production, operational or financial difficulties, or there may be global shortages of certain raw materials or components we use. Our inability to find sufficient sources of supply on reasonable terms could impact our ability to manufacture products in a cost-effective manner, which could have a material adverse effect on our gross margin and results of operations.

We also source many of our components from international markets. Any changes in the laws and policies of the U.S. or other countries affecting trade may be a risk to us. To the extent there are unfavorable changes imposed by the U.S. or other countries and/or retaliatory actions taken by trading partners, such as the addition of new tariffs or trade restrictions, we may experience material adverse impacts on earnings. For a more complete discussion of our risks related to tariffs and trade restrictions, see the risk factor, "Additional tariffs or a global trade war could increase the cost of our products, which could adversely impact the competitiveness of our products" under our "International Risk Factors" in this Item 1A. Risk Factors section.

Capacity constraints with respect to our internal facilities and/or existing or new contract manufacturers could have an adverse impact on our business.

We internally produce, both domestically and internationally, a portion of the components used in our finished products. We also rely on unaffiliated contract manufacturers, both domestically and internationally, to produce certain products or key components of products. If we do not have sufficient production capacity, either through our internal facilities or independent contract manufacturers, or if we cannot ramp up capacity for complex products fast enough to meet customer demand, we may experience lost sales opportunities, lost market share and customer relations problems, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

If our contract manufacturers encounter production, quality, financial or other difficulties, we may experience difficulty in meeting customer demands.

We rely on unaffiliated contract manufacturers, both domestically and internationally, to produce certain products or key components of products. If these contract manufacturers encounter production, quality, financial or other difficulties, including labor disturbances or geopolitical instability, and if acceptable alternative suppliers cannot be identified, we may encounter difficulty in meeting customer demands. Any such difficulties could have a material adverse effect on our business, financial results, results of operations and cash flows.

Strategic Risks

Our business strategy relies in part on acquisitions to create growth. We may not fully realize anticipated benefits from past or future acquisitions or investments in other companies.

We have completed a number of acquisitions and invested in other companies over recent years, most significantly the acquisition of the BNS business from TE Connectivity in 2015. There are significant challenges to integrating an acquired operation into our business, including, but not limited to: successfully managing the operations, manufacturing facilities and technology; integrating the sales organizations; maintaining and increasing the customer base; retaining key employees, suppliers and distributors; integrating management information systems, including enterprise resource planning systems; integrating inventory management and accounting activities; integrating research and development activities; and addressing operating losses that may exist related to individual markets, facilities or product lines. Although we expect to realize strategic, operational and financial benefits as a result of past or future acquisitions and investments, we cannot predict or guarantee whether and to what extent anticipated cost savings, synergies and growth prospects will be achieved.

We anticipate that a portion of any future growth of our business may be accomplished by acquiring existing businesses, products or technologies. However, we may not be able to identify suitable acquisition opportunities or obtain any necessary financing on acceptable terms. We may spend time and money investigating and negotiating with potential acquisition or investment targets but not complete the transaction.

Any future acquisition could involve other risks, including the assumption of additional liabilities and expenses, issuances of debt, incurrence of transaction and integration costs, litigation and diversion of management's attention from other business concerns, and such acquisition may be dilutive to our financial results.

Last November we announced the pending acquisition of ARRIS to be completed in the first half of 2019. For a discussion of the risks associated with the Pending Acquisition, see the "ARRIS Acquisition Risks" noted above under this Item 1A. Risk Factors section.

We may sell or discontinue one or more of our product lines, as a result of our evaluation of our products and markets.

We periodically evaluate our various product lines and may consider the divestiture or discontinuance of one or more of those product lines. Any such divestiture or discontinuance could adversely affect our results of operations, cash flows and financial position.

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Divestitures of product lines have inherent risks, including the expense of selling the product line; the possibility that any anticipated sale will not occur; possible delays in closing any sale; the risk of lower-than-expected proceeds from the sale of the divested business; unexpected costs associated with the separation of the business to be sold from our management information and other operating systems; potential post-closing claims for indemnification; and potential loss of customers. Expected cost savings may also be difficult to achieve or maximize due to a fixed cost structure, and we may experience varying success in the timely reduction of fixed costs or transferring of liabilities previously associated with the divested or discontinued business.

Difficulties may be encountered in the realignment of manufacturing capacity and capabilities among our global manufacturing facilities that could adversely affect our ability to meet customer demand for our products.

We periodically realign manufacturing capacity among our global facilities in order to reduce costs by improving manufacturing efficiency and to strengthen our long-term competitive position. The implementation of these initiatives may include significant shifts of production capacity among facilities.

There are significant risks inherent in the implementation of these initiatives, including our failure to ensure the following: adequate inventory on hand or production capacity to meet customer demand while capacity is being shifted among facilities; maintenance of product quality as a result of shifting capacity; adequate raw material and other service providers to meet the needs at the new production locations; our ability to successfully remove, transport and re-install equipment; and the availability of adequate supervisory, production and support personnel to accommodate the shifted production.

In the event manufacturing realignment initiatives are not successfully implemented, we could experience lost future sales and increased operating costs as well as customer relations problems, any of which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We may need to undertake additional restructuring actions in the future.

We have previously recognized restructuring charges in response to slowdowns in demand for our products and in conjunction with implementation of initiatives to reduce costs and improve efficiency of our operations. In addition, over the past several years, we have undertaken a number of initiatives to support the BNS integration which included the closure of certain domestic and international manufacturing facilities and various other workforce reductions. As a result of changes in business conditions, the Pending Acquisition and other developments, we may need to initiate additional restructuring actions that could result in workforce reductions and restructuring charges, which could be material.

Financial Risks

Our substantial indebtedness could adversely affect our ability to raise additional capital to fund our operations, limit our ability to react to changes in the economy or our industry, expose us to interest rate risk to the extent of our variable rate debt and prevent us from meeting our obligations with respect to our indebtedness.

As of December 31, 2018, we had approximately \$4.0 billion of indebtedness on a consolidated basis. See Note 6 in the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for additional details of our indebtedness. We had no outstanding loans under our revolving credit facility and approximately \$463.1 million in borrowing capacity. Our ability to borrow under our revolving credit facility depends, in part, on inventory, accounts receivable and other assets that fluctuate from time to time and may further depend on lenders' discretionary ability to impose reserves and availability blocks.

In addition, we intend to finance the Pending Acquisition largely with the proceeds of additional indebtedness. On February 19, 2019 we issued \$1.25 billion of 5.50% senior secured notes due 2024, \$1.5 billion of 6.00% senior secured notes due 2026 and \$1.0 billion of 8.25% senior unsecured notes due 2027 and priced the borrowing of \$3.2 billion under a new senior secured term loan due 2026 with an interest rate of LIBOR plus 3.25%. The proceeds of the notes were placed into escrow and will be released upon consummation of the Pending Acquisition, and it is expected that the new senior secured term loan will be borrowed at closing of the Pending Acquisition. We expect to use a portion of the new senior secured term loan to pay off our existing senior secured term loan due December 2022. We also expect to enter into a new asset-based revolving credit facility in an amount of up to \$1.0 billion, subject to borrowing base capacity. As such, as of December 31, 2018, on a pro forma basis after giving effect to the Pending Acquisition, we would have had approximately \$10.5 billion of indebtedness on a consolidated basis. We expect to enter into certain hedging agreements to reduce our exposure to variable rate debt among other risks.

Our substantial indebtedness could have important consequences. For example, it could:

- limit our ability to obtain additional financing for working capital, capital expenditures, acquisitions, investments and other general corporate purposes;
- require a substantial portion of our cash flows to be dedicated to debt service payments and reducing the amount of cash flows available for working capital, capital expenditures, investments or acquisitions and other general corporate purposes;
- expose us to the risk of increased interest rates as the interest cost on a significant portion of our indebtedness is subject to changes in interest rates (especially if our efforts to mitigate this risk through hedging agreements are unsuccessful);
- place us at a competitive disadvantage compared to certain of our competitors who have less debt;
- hinder our ability to adjust rapidly to changing market conditions;
- limit our ability to secure adequate bank financing in the future with reasonable terms and conditions; and
- increase our vulnerability to and limit our flexibility in planning for, or reacting to, a potential downturn in general economic conditions or in one or more of our businesses.

Our variable rate indebtedness may use LIBOR as a benchmark for establishing the rate. On July 27, 2017, the authority that regulates LIBOR announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. It is unclear whether new methods of calculating LIBOR will be established such that it continues to exist after 2021. The U.S. Federal Reserve, in conjunction with the Alternative Reference Rates Committee, is considering replacing U.S. dollar LIBOR with a newly created index, calculated with a broad set of short-term repurchase agreements backed by treasury securities. It is not possible to predict the effect of these changes, other reforms or the establishment of alternative reference rates in the United Kingdom (U.K.), the U.S. or elsewhere.

In addition, the indentures and credit agreements governing our indebtedness contain affirmative and negative covenants that limit our ability to engage in activities that may be in our long-term best interests. Our failure to comply with those covenants could result in an event of default which, if not cured or waived, could result in the acceleration of all of our debt.

Despite current indebtedness levels and restrictive covenants and future anticipated indebtedness and covenants as a result of the Pending Acquisition, we may still incur additional indebtedness that could further exacerbate the risks associated with our substantial financial leverage.

We may incur significant additional indebtedness in the future under the agreements governing our indebtedness. Although the indentures and the credit agreements governing our current indebtedness and our future indebtedness as a result of the Pending Acquisition contain restrictions on the incurrence of additional indebtedness, these restrictions are subject to a number of thresholds, qualifications and exceptions, and the additional indebtedness incurred in

compliance with these restrictions could be substantial. Additionally, these restrictions permit us to incur obligations that, although preferential to our common stock in terms of payment, do not constitute indebtedness.

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To service our indebtedness, we will require a significant amount of cash and our ability to generate cash depends on many factors beyond our control.

Our operations are conducted through our global subsidiaries and our ability to make cash payments on our indebtedness will depend on the earnings and the distribution of funds from our subsidiaries. Certain of our subsidiaries may have limitations or restrictions on paying dividends and otherwise transferring funds to us. Our ability to make cash payments on and to refinance our indebtedness will depend upon our financial condition and operating performance, which are subject to prevailing economic and competitive conditions and to financial, business, legislative, regulatory and other factors beyond our control. We might not be able to maintain a level of cash flows from operating activities or transfer sufficient funds from our subsidiaries to permit us to pay the principal, premium, if any, and interest on our indebtedness.

If we are unable to generate sufficient cash flow or are otherwise unable to obtain funds necessary to meet required payments of principal, premium, if any, and interest on our indebtedness or if we fail to comply with the various covenants in the instruments governing our indebtedness and we are unable to obtain waivers from the required lenders, we could be in default under the terms of the agreements governing such indebtedness. In the event of such default, the holders of our indebtedness could elect to declare all the funds borrowed to be due and payable, together with accrued and unpaid interest. The lenders under our revolving credit facility could elect to terminate their commitments, cease making further loans and institute foreclosure proceedings against our assets. As a result, we could be forced into bankruptcy or liquidation.

We may need to recognize additional impairment charges related to goodwill, identified intangible assets and fixed assets.

We have substantial balances of goodwill, identified intangible assets and fixed assets. We are required to test goodwill for possible impairment on the same date each year and on an interim basis if there are indicators of a possible impairment. We are also required to evaluate identified intangible assets and fixed assets for impairment if there are indicators of a possible impairment.

In the past, due to revisions in financial performance outlooks or deterioration in certain markets, we have recognized significant impairment charges on our goodwill, identified intangible assets and fixed assets. In the future, we may determine, again, that one or more of our long-lived assets is impaired and additional impairment charges may be recognized that could have a material adverse effect on our financial condition and results of operations.

As a result of the Pending Acquisition, we expect our goodwill, identified intangible assets and fixed asset balances to increase significantly, which will compound our risk of impairments and any resulting adverse effects on our financial condition and results of operations.

We may experience significant variability in our quarterly or annual effective income tax rate.

We have a large and complex international tax profile and a significant level of foreign tax credit carryforwards in the U.S. and other carryforwards in various jurisdictions. Variability in the mix and profitability of domestic and international activities, identification and resolution of various tax uncertainties and the inability to realize foreign tax credits and other carryforwards included in deferred tax assets, among other matters, have impacted our effective income tax rate in the past and may impact our effective income tax rate in the future. Tax law changes in the U.S. and certain other countries have also impacted our effective income tax rate in the past and may impact our effective tax rate in the future. A significant increase in our quarterly or annual effective income tax rate could have a material adverse impact on our results of operations.

We are commonly audited by various tax authorities, and some jurisdictions, both in the U.S. and abroad, have become more aggressive in their approach to audits and their enforcement of their applicable tax laws. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. Significant judgment is required in determining our worldwide provision for income taxes. Although we believe our tax estimates are reasonable, the final determination of tax audits and any related litigation could be materially different from our historical income tax provisions and accruals. The results of an audit or litigation could have a material effect on our financial statements in the period or periods for which that determination is made and on our overall effective income tax rate.

There is a risk related to the Pending Acquisition that the Internal Revenue Service does not agree that ARRIS was a foreign corporation for U.S. federal income tax purposes in pre-acquisition periods and we could be subject to substantial additional U.S. taxes. For U.K. tax purposes, ARRIS is expected to be treated as a U.K. tax resident, regardless of how they are treated in the U.S. Therefore, if ARRIS were treated as a U.S. corporation for U.S. federal income tax purposes, we could be liable for both U.S. and U.K. taxes in pre-acquisition periods, which could have a material adverse effect on our financial condition, results of operations and cash flows.

Labor Related Risks

We may not be able to attract and retain key employees.

Our business depends upon our continued ability to hire and retain key employees. Effective succession planning is important to our long-term success. We depend on our senior management team and other key employees for strategic success. Some of our key employees have retired, announced their decision to retire or are at or near retirement age. Failure to ensure effective transfer of knowledge and smooth transitions involving key employees could hinder our strategic planning and execution.

Key employees include individuals in our sales force, operations management, engineers and skilled production workers at our operations around the world. Competition for skilled personnel and highly qualified managers in the industries in which we operate is intense. Our growth by acquisitions creates challenges in retaining employees as well. As the corporate culture evolves to incorporate new workforces, some employees may not find the new culture appealing. In addition, the pace of integration may cause retention issues with our workforce due to integration fatigue.

As our workforce ages and leaves the company, we are challenged to find and attract workers to replace them. As a practical matter, we will be required to draw from different generations in order to fill these positions. Workers from these different generations may be motivated by factors that are different from our current workforce, and we may have difficulty meeting the expectations of these workers. Difficulties in obtaining or retaining employees with the necessary management, technical and financial skills needed to achieve our business objectives may have a material adverse effect on our business, financial condition and results of operations.

Labor unrest could have a material adverse effect on our business, results of operations and financial condition.

Although none of our U.S. employees are represented by unions, a significant portion of our international employees are members of unions or subject to workers' councils or similar statutory arrangements. In addition, many of our direct and indirect customers and vendors have unionized workforces. Strikes, work stoppages or slowdowns experienced by us at our international locations or experienced by our customers or vendors could have a negative impact on us. Organizations responsible for manufacturing or shipping our products may also be impacted by labor disruptions. Any interruption in the delivery of our products and services could harm our reputation with our customers, reduce demand for our products and services, increase costs and have a material adverse effect on us.

We have obligations under our defined benefit employee benefit plans and may be required to make plan contributions in excess of current estimates.

At December 31, 2018, our net liability for pension and other postretirement benefits was \$11.8 million (benefit obligations of \$215.2 million and plan assets of \$203.4 million). See Note 10 in the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K. Significant declines in the valuation of the assets and/or increases in the liabilities related to these obligations as a result of changes in actuarial estimates, asset performance, interest rates or benefit changes, among other assumptions, could have a material adverse impact on our financial position and/or results of operations.

The amounts and timing of the contributions we expect to make to our defined benefit plans reflect a number of actuarial estimates and other assumptions. The actual amounts and timing of these contributions may differ materially from those presented in this Annual Report on Form 10-K. If we elect to terminate one or more of these plans and settle the obligation through the purchase of annuities or otherwise, we could incur a charge and/or be required to make additional contributions and such amounts could be material.

International Risks

Our significant international operations expose us to economic, political and other risks.

We have significant international sales, manufacturing and distribution operations. Our major international manufacturing and/or distribution facilities are located in Australia, Belgium, China, the Czech Republic, Germany, India, Ireland, Mexico, Singapore and the U.K. For the years ended December 31, 2018, 2017 and 2016, international sales represented approximately 44%, 46% and 46%, respectively, of our consolidated net sales. In general, our international sales have lower gross margin percentages than our domestic sales. To the extent international sales represent a greater percentage of our revenue, our overall gross margin percentages may decline.

Our international sales, manufacturing and distribution operations are subject to the risks inherent in operating abroad, including, but not limited to, risks with respect to currency exchange rate fluctuations; economic and political destabilization; restrictive actions by foreign governments; wage inflation; nationalizations; the laws and policies of the U.S. affecting trade, anti-bribery, foreign investment and loans; foreign tax laws, including the ability to recover amounts paid as value-added and similar taxes; potential restrictions on the repatriation of cash; reduced protection of intellectual property; longer customer payment cycles; compliance with local laws and regulations; armed conflict; regional violence; terrorism; shipping interruptions; and major health concerns (such as infectious diseases). A significant portion of our products sold in the U.S. are manufactured outside the U.S. We utilize lower-cost geographies for high labor content products while investing in largely automated plants in higher-cost regions close to customers. Most of our manufacturing employees are located in lower-cost geographies such as Mexico, China, India and the Czech Republic. To the extent there are changes in U.S. trade policies, such as significant increases in tariffs or duties for goods brought into the U.S., our competitive position may be adversely impacted and the resulting effect on our earnings could be material.

In June 2016, the U.K. held a referendum in which voters approved an exit from the European Union (E.U.), commonly referred to as Brexit. As a result of the referendum, the British government began negotiating the terms of the U.K.'s future relationship with the E.U. in March 2017 with a deadline of March 29, 2019 to complete the negotiations. Although it is still unclear what those terms will be or even if a deal will be reached, it is possible that there will be greater restrictions on imports and exports between the U.K. and E.U. countries and increased regulatory complexities. These changes could cause disruptions to and create uncertainty surrounding our business and the business of existing and future customers and suppliers as well as have an impact on our employees based in Europe, which could adversely impact our business, financial condition, results of operations and cash flows.

Risks related to fluctuations in foreign currency rates can impact our sales, results of operations, cash flows and financial position. Our foreign currency risk exposure is mainly concentrated in Chinese yuan, euro, Czech koruna, Australian dollar, Indian rupee, Mexican peso and Brazilian real. We manage our foreign currency rate risks through regular operating and financing activities and use derivative financial instruments such as foreign exchange forward contracts. There can be no assurance that our risk management strategies will be effective or that the counterparties to our derivative contracts will be able to perform. In addition, foreign currency rates in many of the countries in which we operate have at times been extremely volatile and unpredictable. We may choose not to hedge or determine we are unable to effectively hedge the risks associated with this volatility. In such cases, we may experience declines in sales and adverse impacts on earnings and such changes could be material.

Additional tariffs or a global trade war could increase the cost of our products, which could adversely impact the competitiveness of our products.

During 2018, the U.S. administration announced tariffs on certain products imported into the U.S., which has resulted in reciprocal tariffs from other countries, including countries where we operate. The U.S. has renegotiated the North American Free Trade Agreement with Mexico and Canada. The renegotiated agreement remains subject to ratification by the U.S. Congress and by the governments of Mexico and Canada, and the prospects for and timing of approval are uncertain. Note: to confirm status prior to filing.

These developments have created uncertainty about the future relationship between the U.S. and certain of its trading partners and may reduce global trade and trade between the U.S. and other nations, including countries in which we currently operate. Changes in policy or continued uncertainty could depress economic activity and restrict our access to suppliers or customers. We have significant international manufacturing operations, particularly in China and Mexico. The tariffs implemented on our products (or on materials, parts or components we use to manufacture our products) by the U.S. will increase the cost of our products manufactured and imported into the U.S. Tariffs and other trade restrictions announced by other countries on products manufactured in the U.S. could likewise increase the costs of those products when imported into other countries. If additional tariffs or trade restrictions are implemented on our products (or on materials, parts or components we use to manufacture our products) by the U.S. or other countries, the cost of our products manufactured in China, Mexico or other countries and imported into the U.S. or other countries could increase further. These cost increases could adversely affect the demand for our products and/or reduce margins, which could have a material adverse effect on our business and our earnings.

Our international operations expose us to increased challenges in complying with anti-corruption laws and regulations of the U.S. government and various other international jurisdictions.

We are required to comply with the laws and regulations of the U.S. government and various other international jurisdictions, and our failure to comply with these rules and regulations may expose us to significant liabilities. These laws and regulations may apply to companies, individual directors, officers, employees and agents, and may restrict our operations, trade practices, investment decisions and partnering activities. In particular, we are subject to U.S. and foreign anti-corruption laws and regulations, such as the U.S. Foreign Corrupt Practices Act (FCPA) and the U.K. Anti-Bribery Act. Violations of these legal requirements are punishable by criminal fines and imprisonment, civil penalties, disgorgement of profits, injunctions, debarment from government contracts as well as other remedial measures. While we have established policies and procedures designed to assist us and our personnel in complying with applicable U.S. and international laws and regulations, our employees, subcontractors or channel partners could take actions that violate these requirements. In addition, some of the international jurisdictions in which we operate have elevated levels of corruption. As a result, we are exposed to an increased risk of violating anti-corruption laws. Violation of anti-corruption laws could adversely affect our reputation, business, financial condition, results of operations and cash flows and such effects could be material.

We are subject to governmental export and import controls that could subject us to liability or impair our ability to compete in international markets.

Certain of our products, including purchased components of such products, are subject to export controls and may be exported only with the required export license or through an export license exception. In addition, we are required to comply with certain U.S. and foreign import and customs rules, sanctions and embargos. If we were to fail to comply with applicable export licensing, customs regulations, economic sanctions and other laws, we could be subject to substantial civil and criminal penalties, including fines, the incarceration of responsible employees and managers, and the possible loss of export or import privileges. In addition, if our distributors fail to obtain appropriate import, export or re-export licenses or permits, we may also be adversely affected through reputational harm and penalties. Obtaining the necessary export license for a particular sale may be time-consuming and may result in the delay or loss of sales opportunities. Furthermore, export control laws and economic sanctions prohibit the shipment of certain products to embargoed or sanctioned countries, governments and persons. While we train our employees to comply with these regulations, we cannot assure that a violation will not occur, whether knowingly or inadvertently. Any such shipment could have negative consequences including government investigations, penalties, fines, civil and criminal sanctions, and reputational harm. Any change in export or import regulations, economic sanctions or related legislation, shift in the enforcement or scope of existing regulations, or change in the countries, governments, persons or technologies targeted by such regulations, could result in our decreased ability to export, import or sell our products to existing or potential customers, particularly those with international operations. Any decreased use of our products or limitation on our ability to export, import or sell our products could adversely affect our business, financial condition, results of operations and cash flows and such effects could be material.

Litigation and Regulatory Risks

We may incur costs and may not be successful in protecting our intellectual property and in defending claims that we are infringing on the intellectual property of others.

We may encounter difficulties and significant costs in protecting our intellectual property rights or obtaining rights to additional intellectual property to permit us to continue or expand our business. Other companies, including some of our largest competitors, hold intellectual property rights in our industry and the intellectual property rights of others could inhibit our ability to introduce new products unless we secure necessary licenses on commercially reasonable terms.

In the past, we have initiated litigation in order to enforce patents issued or licensed to us or to determine the scope and/or validity of a third party's patent or other proprietary rights and we may initiate similar litigation in the future. We also have been and may in the future be subject to lawsuits by third parties seeking to enforce their own intellectual property rights, including against certain of the products or intellectual property that we have acquired through acquisitions. Any such litigation, regardless of outcome, could be costly and could subject us to significant liabilities or require us to cease using proprietary third party technology and, consequently, could have a material adverse effect on our results of operations, financial condition and cash flows. Such litigation can also be a significant distraction to management.

In certain markets, we may be required to address counterfeit versions of our products. We may incur significant costs in pursuing the originators of such counterfeit products and, if we are unsuccessful in eliminating them from the market, we may experience a reduction in the value of our products and/or a reduction in our net sales.

Compliance with current and future environmental laws and potential environmental liabilities may have a material adverse impact on our business, financial condition and results of operations.

We are subject to various federal, state, local and foreign environmental laws and regulations governing, among other things, discharges to air and water, management of regulated materials, handling and disposal of solid and hazardous waste, and investigation and remediation of contaminated sites. In addition, we are subject to laws and regulations regarding the types of substances allowable in certain of our products and the handling of our products at the end of their useful life. Because of the nature of our business, we have incurred and will continue to incur costs relating to compliance with or liability under these environmental laws and regulations and these costs could be material. In addition, new laws and regulations, new or different interpretations of existing laws and regulations, expansion of existing legal requirements related to our products, the discovery of previously unknown contamination or the imposition of new remediation or discharge requirements, could require us to incur costs or become the basis for new or increased liabilities that could have a material adverse effect on our financial condition.

Efforts to regulate emissions of greenhouse gases (GHGs), such as carbon dioxide, are underway in the U.S. and other countries which could increase the cost of raw materials, production processes and transportation of our products. If we are unable to comply with such regulations or sufficiently increase prices or otherwise reduce costs to offset the increased costs of compliance, GHG regulation could have a material adverse effect on our business, financial condition, results of operations and cash flow.

Certain environmental laws impose strict and, in some circumstances, joint and several liability on current or former owners or operators of a contaminated property, as well as companies that generated, disposed of or arranged for the disposal of hazardous substances at a contaminated property, for the costs of investigation and remediation of the contaminated property. Our present and past facilities have been in operation for many years and over that time, in the course of those operations, hazardous substances and wastes have been used, generated and occasionally disposed of at such facilities, and we have disposed of waste products either directly or through third parties at numerous disposal sites. Consequently, it has been necessary to undertake investigation and remediation projects at certain sites and we have been and may in the future be held responsible for a portion of the investigation and clean-up costs at these sites and our share of those costs may be material.

Common Stock Ownership Risks

We do not intend to pay dividends on our common stock and, consequently, the ability of investors to achieve a return on their investment will depend on appreciation in the price of our common stock.

We do not intend to declare and pay dividends on our common stock for the foreseeable future. The payment of future dividends will be at the discretion of our Board of Directors; however, the indentures and the credit agreements governing our indebtedness place limitations on our ability to pay dividends. We currently intend to invest our future earnings, if any, to fund our growth and reduce our debt and our Board of Directors may choose to provide returns to our stockholders through share repurchases. The success of an investment in our common stock will largely depend upon future appreciation in value, and there can be no guarantee that our common stock will appreciate in value.

Provisions of our certificate of incorporation and bylaws and Delaware law might discourage, delay or prevent a change of control of our company or changes in our management and, as a result, depress the trading price of our common stock.

Our certificate of incorporation and bylaws contain provisions that could discourage, delay or prevent a change in control of our company or changes in our management that the stockholders of our company may deem advantageous. These provisions:

authorize 1,300,000,000 shares of common stock, which, to the extent unissued, could be issued by the Board of Directors, without stockholder approval, to increase the number of outstanding shares and to discourage a takeover attempt;

authorize the issuance, without stockholder approval, of blank check preferred stock that our Board of Directors could issue to increase the number of outstanding shares and to discourage a takeover attempt;

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- grant to the Board of Directors the sole power to set the number of directors and to fill any vacancy on the Board of Directors;
- limit the ability of stockholders to remove directors only “for cause” and require any such removal to be approved by holders of at least three-quarters of the outstanding shares of common stock;
- prohibit our stockholders from calling a special meeting of stockholders;
 - prohibit stockholder action by written consent, which requires all stockholder actions to be taken at a meeting of our stockholders;
- provide that the Board of Directors is expressly authorized to adopt, or to alter or repeal our bylaws;
- establish advance notice and certain information requirements for nominations for election to our Board of Directors or for proposing matters that can be acted upon by stockholders at stockholder meetings;
- establish a classified Board of Directors, with three staggered terms; and
- require the approval of holders of at least three-quarters of the outstanding shares of common stock to amend the bylaws and certain provisions of the certificate of incorporation.

These anti-takeover defenses could discourage, delay or prevent a transaction involving a change in control of our company and may prevent our stockholders from receiving the benefit from any premium to the market price of our common stock offered by a bidder in a takeover context. Even in the absence of a takeover attempt, the existence of these provisions may adversely affect the prevailing market price of our common stock if the provisions are viewed as discouraging takeover attempts in the future. These provisions could also discourage proxy contests and make it more difficult for our stockholders to elect directors of their choosing and cause us to take corporate actions other than those our stockholders may desire.

Our business could be negatively impacted as a result of actions by activist stockholders or others.

Stockholder activism has been increasing in publicly traded companies in recent years and we are subject to the risks associated with such activism, particularly due to the recent decline in our stock price. Our business could be negatively affected as a result of stockholder activism, which could cause us to incur significant legal fees and other costs, hinder execution of our business strategy and impact the trading value of our securities. Additionally, stockholder activism could give rise to perceived uncertainties as to our future direction, adversely affect our relationships with key executives and business partners and make it more difficult to attract and retain qualified employees. Any of these impacts could materially and adversely affect our business and operating results.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our facilities are used primarily for manufacturing, distribution and administration. Facilities primarily used for manufacturing may also be used for distribution, engineering, research and development, storage, administration, sales and customer service. Facilities primarily used for administration may also be used for research and development, sales and customer service. As of December 31, 2018, our principal facilities, grouped according to the facility's primary use, were as follows:

Location	Approximate square feet	Principal segments	Owned or leased
Administrative facilities:			
Hickory, NC (1)	84,000	Corporate headquarters	Owned
Joliet, IL (2)	690,000	Corporate	Leased
Shakopee, MN	177,000	CCS	Leased
Richardson, TX (1)	100,000	CMS	Owned
Manufacturing and distribution facilities:			
Catawba, NC (1)	1,000,000	CCS	Owned
Claremont, NC (1)	589,000	CCS	Owned
Kessel-Lo, Belgium	431,000	CCS	Owned
Suzhou, China (3)	414,000	CMS	Owned
Suzhou, China (3)	363,000	CCS	Owned
Santa Teresa, NM	334,000	CCS	Leased
Juarez, Mexico	327,000	CCS	Owned
Juarez, Mexico	304,000	CCS	Leased
Goa, India (4)	298,000	CMS	Owned
Brno, Czech Republic	281,000	CCS	Leased
Reynosa, Mexico	279,000	CMS	Owned
Greensboro, NC (1)	196,000	CCS	Owned
Mission, TX	150,000	CMS	Leased
Delicias, Mexico	139,000	CCS	Owned
Campbellfield, Australia	133,000	CMS	Leased
Bray, Ireland	130,000	CCS	Owned
Brno, Czech Republic	120,000	CMS	Leased
Buchdorf, Germany	109,000	CMS	Owned
Vacant facilities and properties:			
Orland Park, IL (1)(4)	—	CMS	Owned
Sorocaba, Brazil (5)	152,000	CMS	Owned

(1) Our interest in each of these properties is encumbered by a mortgage or deed of trust lien securing our senior secured credit facilities (see Note 6 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K).

(2) The former manufacturing portion of the Joliet facility is vacant and is currently being marketed for sublease.

(3) The buildings in these facilities are owned while the land is held under long-term lease agreements.

(4) The building at the Orland Park facility was demolished and cleared and the 73 acre parcel is vacant.

(5) The Sorocaba, Brazil facility is currently being marketed for sale.

We believe that our facilities and equipment generally are well maintained, in good condition and suitable for our purposes and adequate for our present operations. While we currently have excess manufacturing capacity in certain of our facilities, utilization is subject to change based on customer demand. We can give no assurances that we will

not have excess manufacturing capacity or encounter capacity constraints over the long term.

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ITEM 3. LEGAL PROCEEDINGS

The material set forth under “Commitments and Contingencies” in Note 13 to the Consolidated Financial Statements in Part II, Item 8 of this Annual Report on Form 10-K is incorporated herein by reference. Management believes none of these legal matters will be material to our business or financial condition upon their final disposition.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

Stock Price and Dividends

Our common stock is traded on the Nasdaq Global Select Market under the symbol COMM.

As of February 7, 2019, all of our outstanding shares of common stock are held by one stockholder of record, Cede & Co., as nominee for the Depository Trust Company. Many brokers, banks and other institutions hold shares of common stock as nominees for beneficial owners that deposit these shares of common stock in participant accounts at the Depository Trust Company.

Issuer Purchases of Equity Securities

The authorization granted by the Company’s Board of Directors in August 2017 to repurchase up to \$100.0 million of the Company’s outstanding common stock expired on July 31, 2018.

The following table summarizes the stock purchase activity for the three months ended December 31, 2018:

Period	Total Number of Shares Purchased (1)	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Value of Shares that May Yet be Purchased Under the Plans or Programs
October 1, 2018 - October 31, 2018	156	\$ 29.79	—	\$ —
November 1, 2018 - November 30, 2018	5,272	\$ 19.39	—	\$ —
December 1, 2018 - December 31, 2018	518	\$ 16.05	—	\$ —
Total	5,946	\$ 19.37	—	

(1) The shares purchased were withheld to satisfy the withholding tax obligations related to restricted stock units and performance share units that vested during the period.

Stock Performance Graph

Edgar Filing: CommScope Holding Company, Inc. - Form 10-K

The following graph compares cumulative total return on \$100 invested on December 31, 2013 in each of CommScope's Common Stock, the Standard & Poor's 500 Stock Index (S&P 500 Index) and the Standard & Poor's 1500 Communications Equipment Index (S&P 1500 Communications Equipment). The return of the Standard & Poor's indices is calculated assuming reinvestment of dividends. CommScope has not paid any dividends over this period.

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Company / Index	Base Period	INDEXED RETURNS				
		12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
CommScope Holding Company, Inc.	100	120.60	136.77	196.51	199.84	86.58
S&P 500 Index	100	113.69	115.26	129.05	157.22	150.33
S&P 1500 Communications Equipment	100	112.89	100.26	120.03	146.99	165.46

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ITEM 6. SELECTED FINANCIAL DATA

The following table presents our historical selected financial data as of the dates and for the periods indicated. The data for each of the years presented are derived from our audited consolidated financial statements. The information set forth below should be read in conjunction with our audited consolidated financial statements and notes thereto and Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" of this Annual Report.

Five-Year Summary of Selected Financial Data

(In thousands, except per share amounts)

	Year Ended December 31,				
	2018	2017	2016	2015	2014
Results of Operations:					
Net sales	\$4,568,507	\$4,560,582	\$4,923,621	\$3,807,828	\$3,829,614
Gross profit ⁽¹⁾	1,688,284	1,767,803	2,029,250	1,338,658	1,390,907
Restructuring costs, net	44,025	43,782	42,875	29,488	19,267
Asset impairments	15,000	—	38,552	90,784	12,096
Operating income ⁽¹⁾	449,968	472,039	567,639	169,615	566,403
Net interest expense	(235,000)	(252,838)	(272,010)	(230,533)	(173,981)
Net income (loss)	140,217	193,764	222,838	(70,875)	236,772
Earnings (Loss) Per Share Information:					
Weighted average number of shares outstanding:					
Basic	192,022	192,430	192,470	189,876	186,905
Diluted	195,332	196,811	196,459	189,876	191,450
Earnings (loss) per share:					
Basic	\$0.73	\$1.01	\$1.16	\$(0.37)	\$1.27
Diluted	\$0.72	\$0.98	\$1.13	\$(0.37)	\$1.24
Other Information:					
Net cash generated by operating activities	\$494,144	\$586,286	\$640,221	\$327,115	\$394,733
Depreciation and amortization	357,458	378,012	399,050	303,500	259,504
Additions to property, plant and equipment	82,347	68,721	68,314	56,501	36,935
	As of December 31,				
	2018	2017	2016	2015	2014
Balance Sheet Data:					
Cash and cash equivalents	\$458,195	\$453,977	\$428,228	\$562,884	\$729,321
Goodwill and intangible assets	4,204,299	4,522,714	4,567,369	4,838,119	2,712,814
Property, plant and equipment, net	450,861	467,289	474,990	528,706	289,371
Total assets	6,630,540	7,041,666	7,141,986	7,502,631	4,917,058
Working capital	1,187,203	1,220,142	1,135,946	1,319,548	1,351,805
Long-term debt, including current maturities	3,985,904	4,369,401	4,562,010	5,243,651	2,668,898
Stockholders' equity	1,756,768	1,647,826	1,394,084	1,222,720	1,307,619

(1) As of January 1, 2018, the Company adopted new accounting guidance requiring that the service cost component of net periodic benefit cost be reported in the same line item as other compensation costs arising from services rendered by the employee and requiring that the other components of net periodic benefit cost be reported outside the subtotal of operating income. The guidance has been applied retrospectively to the prior periods presented.

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements based upon current expectations that involve risks and uncertainties. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth under "Risk Factors" included in Part I, Item 1A or in other parts of this Annual Report on Form 10-K.

OVERVIEW

We are a global provider of infrastructure solutions for communication networks. Our solutions and services for wired and wireless networks enable high-bandwidth data, video and voice applications. Our portfolio includes innovative wireless and fiber optic solutions for today's evolving digital lifestyle. Our global leadership position is built upon innovative technology, broad solution offerings, high-quality and cost-effective customer solutions and global manufacturing and distribution scale. Our talented and experienced global team helps customers increase bandwidth; maximize existing capacity; improve network response time and performance; and simplify technology migration. Our solutions are found in some of the largest venues and outdoor spaces; in buildings and data centers of all sizes and complexities; at wireless cell sites; in telecom central offices and cable headends; in fiber-to-the-X (FTTX) deployments; and in airports, trains, and tunnels. Vital networks around the world run on CommScope solutions.

On November 8, 2018, we announced that we have entered into an agreement to acquire ARRIS International plc (ARRIS) (the Pending Acquisition) in an all cash transaction with a total purchase price of approximately \$7.4 billion, or \$31.75 per outstanding ARRIS share. We expect the transaction to close during the first half of 2019. See Part I, Item 1, "Business—Strategy—ARRIS Acquisition Rationale" for a discussion of strategy behind the acquisition of ARRIS and see Part I, Item 1A., "Risk Factors—ARRIS Acquisition Risks" for a discussion of risks related to the pending acquisition of ARRIS.

To fund the Pending Acquisition, on February 19, 2019 we issued \$1.25 billion of 5.50% senior secured notes due 2024, \$1.5 billion of 6.00% senior secured notes due 2026 and \$1.0 billion of 8.25% senior unsecured notes due 2027 and priced the borrowing of \$3.2 billion under a new senior secured term loan due 2026 with an interest rate of LIBOR plus 3.25%. The proceeds of the notes were placed into escrow and will be released upon consummation of the Pending Acquisition, and it is expected that the new senior secured term loan will be borrowed at closing of the Pending Acquisition. We expect to use a portion of the new senior secured term loan to pay off our existing senior secured term loan due December 2022. We also expect to enter into a new asset-based revolving credit facility in an amount of up to \$1.0 billion, subject to borrowing base capacity. In addition to the new debt, we expect to fund the Pending Acquisition by issuing 1.0 million shares of series A convertible preferred stock to the Carlyle Group for \$1,000 per share, or an aggregate investment of \$1.0 billion.

The following is a summary of our results for the year ended December 31, 2018 compared to the prior year:

- ◆ Net sales were essentially flat with an increase of less than 1%;
- ◆ Operating income decreased 4.7%;
- ◆ Non-GAAP adjusted operating income decreased 4.4%;
- ◆ Non-GAAP adjusted EBITDA decreased 4.7%;
- ◆ Net income decreased 27.7%; and
- ◆ Diluted earnings per share decreased 26.5%.

We report financial performance based on two operating segments: CommScope Connectivity Solutions (CCS) and CommScope Mobility Solutions (CMS). For an overview of our operating segments, see Part I, Item I "Business –

Operating Segments.”

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Our future financial condition and performance will be largely dependent upon: global spending by wireless operators; global spending by business enterprises on information technology; investment by cable operators and communications companies in video and communications infrastructure; overall global business conditions; and our ability to manage costs successfully across our global operations. Our profitability is also affected by the mix and volume of sales among our various product groups and between domestic and international customers and competitive pricing pressures.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our consolidated financial statements have been prepared in conformity with generally accepted accounting principles (GAAP) in the United States (U.S.). The preparation of these financial statements requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. These estimates and their underlying assumptions form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other objective sources. Management bases its estimates on historical experience and on assumptions that are believed to be reasonable under the circumstances and revises its estimates, as appropriate, when changes in events or circumstances indicate that revisions may be necessary.

The following critical accounting policies and estimates reflected in our financial statements are based on management's knowledge of and experience with past and current events and on management's assumptions about future events. While we have generally not experienced significant deviations from our critical estimates in the past, it is reasonably possible that these estimates may ultimately differ materially from actual results. See Note 2 in the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for a description of all of our significant accounting policies.

Business Combinations

We use the acquisition method of accounting for business combinations which requires assets acquired and liabilities assumed be recorded at their fair values on the acquisition date. Goodwill represents the excess of the purchase price over the fair value of the net assets acquired. The fair values of the assets acquired and liabilities assumed are determined based upon management's valuation and involves making significant estimates and assumptions based on facts and circumstances that existed as of the acquisition date. We use a measurement period following the acquisition date to gather information that existed as of the acquisition date that is needed to determine the fair value of the assets acquired and liabilities assumed. The measurement period ends once all information is obtained, but no later than one year from the acquisition date.

Revenue Recognition

We recognize revenue based on the satisfaction of distinct obligations to transfer goods and services to customers. The majority of our revenue is from product sales. Revenue from product sales is recognized when control is transferred to the customer, typically upon either shipment or delivery. A minor portion of our revenue is derived from project contracts containing a combination of product and service obligations. Revenue from project contracts is recognized either at a point in time or over time using cost input methods, based on the specific terms of each contract.

For project contracts containing multiple distinct performance obligations, the transaction price is allocated based on the relative standalone estimated selling price of each performance obligation. The relative standalone selling price is determined using current price lists and observable pricing in separate contracts with similar customers. For performance obligations recognized over-time, judgment is required to evaluate assumptions, including the total estimated costs to determine progress towards completion of the performance obligation and to calculate the corresponding amount of revenue to recognize. If estimated total costs on any contract are greater than the net contract

revenues, the entire estimated loss is recognized in the period the loss becomes known. The cumulative effects on revenue from revisions to total estimated costs are recorded in the period in which the revisions to estimates are identified and the amounts can be reasonably estimated.

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We also recognize revenue from other customer contract types, including licensing of intellectual property, software licensing and post-contract support (PCS) which may be sold as part of a bundled product offering or as a separate contract. For bundled product arrangements, the transaction price is allocated based on the relative standalone estimated selling price of each performance obligation. Distinct intellectual property obligations, including software, are considered functional in nature and are recognized as revenue at the point in time the customer receives the rights to use and benefit from the intellectual property or are determined using a usage-based royalty. PCS obligations are typically recognized over the term of the contract.

Revenue is measured based on the consideration to which we expect to be entitled, based on customer contracts. For sales to distributors, system integrators and value-added resellers (primarily for CCS segment), revenue is adjusted for variable consideration amounts, including estimated discounts, returns, rebates and distributor price protection programs. These estimates are determined based upon historical experience, contract terms, inventory levels in the distributor channel and other related factors. Adjustments to variable consideration estimates are recorded when circumstances indicate revisions may be necessary.

We record a contract asset for unbilled accounts receivable related to revenue that has been recognized in advance of consideration being unconditionally due from the customer, which is common for certain project contract performance obligations. Contract asset amounts are transferred to accounts receivable when our right to the consideration becomes unconditional, which varies by contract, but is generally based on achieving certain acceptance milestones.

A contract liability for deferred revenue is recorded when consideration is received or is unconditionally due from a customer prior to transferring control of goods or services to the customer under the terms of a contract. Deferred revenue balances typically result from advance payments received from customers for product contracts or from billings in excess of revenue recognized on project or services arrangements.

We include shipping and handling costs billed to customers in net sales and include the costs incurred to transport product to customers as cost of sales. Shipping and handling costs incurred after control is transferred to the customer are accounted for as fulfillment costs and are not accounted for as separate revenue obligations.

Inventory Reserves

We maintain reserves to reduce the value of inventory based on the lower of cost or net realizable value, including allowances for excess and obsolete inventory. These reserves are based on management's assumptions about and analysis of relevant factors including current levels of orders and backlog, forecasted demand, market conditions and new products or innovations that diminish the value of existing inventories. If actual market conditions deteriorate from those anticipated by management, additional allowances for excess and obsolete inventory could be required and may be material to earnings.

Product Warranty Reserves

We recognize a liability for the estimated claims that may be paid under our customer assurance-type warranty agreements to remedy potential deficiencies of quality or performance of our products. The product warranties extend over periods ranging from one to twenty-five years from the date of sale, depending upon the product subject to the warranty. We record a provision for estimated future warranty claims based upon the historical relationship of warranty claims to sales and specifically identified warranty issues. We base our estimates on historical experience and on assumptions that are believed to be reasonable under the circumstances and revise our estimates, as appropriate, when events or changes in circumstances indicate that revisions may be necessary. Although these estimates are based on management's knowledge of and experience with past and current events and on management's assumptions about future events, it is reasonably possible that they may ultimately differ materially from actual

results, including in the case of a significant product failure.

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Tax Valuation Allowances and Liabilities for Unrecognized Tax Benefits

We establish an income tax valuation allowance when available evidence indicates that it is more likely than not that all or a portion of a deferred tax asset will not be realized. In assessing the need for a valuation allowance, we consider the amounts, character, source and timing of expected future deductions or carryforwards as well as sources of taxable income and tax planning strategies that may enable utilization. We maintain an existing valuation allowance until sufficient positive evidence exists to support its reversal. Changes in the amount or timing of expected future deductions or taxable income may have a material impact on the level of income tax valuation allowances. If we determine that we will not be able to realize all or part of a deferred tax asset in the future, an increase to an income tax valuation allowance would be charged to earnings in the period such determination was made.

We recognize income tax benefits related to particular tax positions only when it is considered more likely than not that the tax position will be sustained if examined on its technical merits by tax authorities. The amount of benefit recognized is the largest amount of tax benefit that is evaluated to be greater than 50% likely to be realized. Considerable judgment is required to evaluate the technical merits of various positions and to evaluate the likely amount of benefit to be realized. Lapses in statutes of limitations, developments in tax laws, regulations and interpretations, and changes in assessments of the likely outcome of uncertain tax positions could have a material impact on the overall tax provision.

We establish deferred tax liabilities for the estimated tax cost associated with foreign earnings that we do not consider permanently reinvested (primarily foreign withholding and state income taxes). These liabilities are subject to adjustment if there is a change in the assertion of whether the foreign earnings are considered to be permanently reinvested.

We also establish allowances related to value-added and similar recoverable taxes when it is considered probable that those assets are not recoverable. Changes in the probability of recovery or in the estimates of the amount recoverable are recognized in the period such determination is made and may be material to earnings.

Asset Impairment Reviews

Impairment Reviews of Goodwill

We test goodwill at the reporting unit level for impairment annually as of October 1 and on an interim basis when events occur or circumstances indicate the carrying value may no longer be recoverable. The goodwill impairment test starts with a comparison of the carrying value of a reporting unit to its estimated fair value. We estimate the fair value of a reporting unit through the use of a discounted cash flow (DCF) valuation model. The significant assumptions in the DCF model are the annual revenue growth rate, the annual operating income margin and the discount rate used to determine the present value of the cash flow projections. Among other inputs, the annual revenue growth rate and operating income margin are determined by management using historical performance trends, industry data, insight derived from customers, relevant changes in the reporting unit's underlying business and other market trends that may affect the reporting unit. The discount rate is based on the estimated weighted average cost of capital as of the test date of market participants in the industry in which the reporting unit operates. The assumptions used in the DCF model are subject to significant judgment and uncertainty. Changes in projected revenue growth rates, projected operating income margins or estimated discount rates due to uncertain market conditions, loss of one or more key customers, changes in technology, or other factors, could result in one or more of our reporting units with a significant amount of goodwill failing the goodwill impairment test in the future. It is possible that future impairment reviews may indicate additional impairments of goodwill, which could be material to our results of operations and financial position. Our historical or projected revenues or cash flows may not be indicative of actual future results.

2018 Annual Goodwill Analysis

The annual test of goodwill was performed for each of the reporting units with goodwill balances as of October 1, 2018. The weighted average discount rates used in the 2018 annual test were 9.5% for the CCS reporting units and 10.0% for the CMS reporting units. These discount rates were unchanged from those used in the 2017 annual goodwill impairment tests. Based on the estimated fair values generated by our DCF models, the reporting units passed the annual goodwill impairment test. The Company considered the sensitivity to changes in key assumptions for the reporting unit with the lowest level of headroom and determined that a fifty basis point change in the discount rate or long-term growth rate would result in a potential impairment. Accordingly, if performance is worse than anticipated, future impairment tests could result in impairment charges that could be material to our results of operations.

Definite-Lived Intangible Assets and Other Long-Lived Assets

Management reviews definite-lived intangible assets and other long-lived assets for impairment when events or changes in circumstances indicate that their carrying values may not be fully recoverable. This analysis differs from our goodwill impairment analysis in that an intangible or other long-lived asset impairment is only deemed to have occurred if the sum of the forecasted undiscounted future net cash flows related to the assets being evaluated is less than the carrying value of the assets. If the forecasted net cash flows are less than the carrying value, then the asset is written down to its estimated fair value. During 2018, we recorded an impairment charge of \$15.0 million allocated equally to the CCS and CMS segments related to our equity investment in a privately-held company. Other than this equity investment impairment and other certain assets abandoned or disposed of as part of restructuring actions, we did not identify any other impairments of definite-lived intangible assets or other long-lived assets in 2018. Changes in the estimates of forecasted net cash flows may result in future asset impairments that could be material to our results of operations.

RESULTS OF OPERATIONS

Comparison of results of operations for the year ended December 31, 2018 with the year ended December 31, 2017

	Year Ended December 31,				\$	%
	2018	2017	% of Net	% of Net		
	Amount	Sales	Amount	Sales	Change	Change
	(dollars in millions, except per share amounts)					
Net sales	\$4,568.5	100.0%	\$4,560.6	100.0%	\$7.9	0.2 %
Gross profit	1,688.3	37.0	1,767.8	38.8	(79.5)	(4.5)
Operating income	450.0	9.9	472.0	10.3	(22.0)	(4.7)
Non-GAAP adjusted operating income ⁽¹⁾	838.0	18.3	876.7	19.2	(38.7)	(4.4)
Net income	140.2	3.1	193.8	4.2	(53.6)	(27.7)
Diluted earnings per share	\$0.72		\$0.98		\$(0.26)	(26.5)

(1) See "Reconciliation of Non-GAAP Measures" in this Management's Discussion and Analysis of Financial Condition and Results of Operations, below.

Net sales

	Year Ended		\$	%
	December 31, 2018	December 31, 2017		
	(dollars in millions)			
Net sales	\$4,568.5	\$4,560.6	\$7.9	0.2 %
Domestic net sales	2,539.2	2,449.4	89.8	3.7
International net sales	2,029.3	2,111.2	(81.9)	(3.9)

Net sales. Net sales for 2018 were essentially flat compared to 2017. Net sales in the U.S. and the Europe, Middle East and Africa (EMEA) region increased in 2018 compared to 2017. The increase in the U.S. was driven by higher sales volumes primarily as a result of government initiatives to promote the expansion of wireless networks but was partially offset by reductions in certain selling prices. Net sales in the U.S. also benefitted from incremental net sales in 2018 related to the acquisition of Cable Exchange on August 1, 2017. The increase in net sales in the EMEA region for 2018 was driven mostly by favorable foreign exchange rate changes. These increases in net sales were largely offset by decreases in the Asia Pacific (APAC) region as a result of projects in 2017 that did not recur in 2018. Net sales in the Caribbean and Latin America (CALA) region also decreased in 2018 with higher sales volumes being more than offset by unfavorable foreign exchange rate changes. Net sales to customers located outside of the U.S. comprised 44% for 2018 compared to 46% for 2017.

From a segment perspective, net sales from the CCS segment and the CMS segment in 2018 were both relatively unchanged compared to 2017. CCS segment net sales in the EMEA region and in the U.S. both increased but these

were mostly offset by decreases in the APAC region. Net sales from the CMS segment increased in the U.S. but that increase was mostly offset by decreases in the APAC region. For further details by segment, see the section titled “Segment Results” below.

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Gross profit, SG&A expense and R&D expense

	Year Ended		\$	%	
	December 31, 2018	December 31, 2017			
	(dollars in millions)				
Gross profit	\$1,688.3	\$1,767.8	\$(79.5)	(4.5)	%
As a percent of sales	37.0	% 38.8			%
SG&A expense	729.0	795.4	(66.4)	(8.3))
As a percent of sales	16.0	% 17.4			%
R&D expense	185.7	185.6	0.1	0.1	
As a percent of sales	4.1	% 4.1			%

Gross profit (net sales less cost of sales). Despite higher sales volumes and favorable product and geographic mix, gross profit and gross profit as a percentage of sales decreased for 2018, primarily due to reductions in certain selling prices, higher material costs and unfavorable foreign exchange rate changes.

Selling, general and administrative expense. Selling, general and administrative (SG&A) expense for 2018 was lower than 2017 due primarily to benefits from cost reduction initiatives and lower costs related to the integration of the Broadband Network Solutions (BNS) business acquired from TE Connectivity in 2015. These decreases in costs were partially offset by higher transaction costs related to the pending acquisition of ARRIS, higher incentive compensation expense and higher bad debt expense in 2018. SG&A expense as a percentage of sales decreased from the prior year as a result of these overall net reductions in expense.

Research and development. Research and development (R&D) expense and R&D expense as a percentage of sales were virtually unchanged for 2018 compared to the prior year. R&D activities generally relate to ensuring that our products are capable of meeting the evolving technological needs of our customers, bringing new products to market and modifying existing products to better serve our customers.

Amortization of purchased intangible assets, Restructuring costs and Asset impairments

	Year Ended		\$	%	
	December 31, 2018	December 31, 2017			
	(dollars in millions)				
Amortization of purchased intangible assets	\$264.6	\$271.0	\$(6.4)	(2.4))%
Restructuring costs, net	44.0	43.8	0.2	0.5	
Asset impairments	15.0	—	15.0	NM	

NM – Not meaningful

Amortization of purchased intangible assets. The amortization of purchased intangible assets decreased for 2018 compared to the prior year because certain of our intangible assets became fully amortized. This decrease was partially

offset during 2018 by the amortization of intangible assets related to the Cable Exchange acquisition that occurred in August 2017.

Restructuring costs, net. Restructuring costs, net for 2018 were related to the continuing integration of the BNS business and a voluntary retirement program in the U.S. that was initiated in the fourth quarter of 2018. Restructuring costs, net for 2017 were primarily related to the continuing integration of the BNS business. No significant additional restructuring charges are expected to be incurred to complete the previously announced BNS integration initiatives. From a cash perspective, we paid \$42.1 million to settle restructuring liabilities during 2018. We expect to pay \$29.9 million in 2019 and \$5.2 million between 2020 and 2022 related to restructuring actions that have been initiated. Additional restructuring actions may be identified and the resulting charges and cash requirements may be material.

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Asset impairments. During 2018, we recorded an impairment charge of \$15.0 million allocated equally to the CCS and CMS segments to fully impair an equity investment in a privately-held company. We did not record any asset impairment charges during 2017.

Net interest expense, Other expense, net and Income taxes

	Year Ended			
	December 31,		\$	%
	2018	2017	Change	Change
	(dollars in millions)			
Net interest expense	\$(235.0)	\$(252.8)	\$ 17.8	(7.0)%
Other expense, net	(44.3)	(9.5)	(34.8)	366.3
Income tax expense	(30.5)	(16.0)	(14.5)	90.6

Net interest expense. Net interest expense for 2018 decreased due to lower long-term debt balances as a result of the voluntary repayments in the fourth quarter of 2017 and in July 2018 on the senior secured term loan due 2022 (the 2022 Term Loan) as well as the May 2017 amendment to reduce the interest rate margin on the 2022 Term Loan. These decreases were partially offset by an increase in LIBOR. In connection with the repayment of the 2022 Term Loan in July 2018, we wrote off \$7.4 million of debt issuance costs and original issue discount. Similarly, in 2017, we wrote off \$14.1 million of debt issuance costs and original issue discount in connection with the redemption of \$500.0 million of 4.375% senior secured notes due 2020 (the 2020 Notes) and the repayment of \$460.0 million of senior secured term loans. The redemption of the 2020 Notes and the repayment of the senior secured term loans were substantially funded by the issuance in March 2017 of \$750.0 million of 5.00% senior notes due 2027 (the 2027 Notes).

Our weighted average effective interest rate on outstanding borrowings, including the amortization of debt issuance costs and original issue discount, was 5.73% at December 31, 2018 and 5.45% at December 31, 2017.

Other expense, net. In 2018, we terminated a significant U.S. defined benefit pension plan which was settled through the purchase of annuities. As a result of the settlement, we recognized a pretax charge in other expense, net primarily related to unrecognized net actuarial losses previously recorded in accumulated other comprehensive loss of \$34.5 million. We also amended certain of our U.S. postretirement medical plans to terminate benefits as of December 31, 2018. We recognized a pretax gain in other expense, net in 2018 of \$9.7 million related to unrecognized prior service credits and unrecognized net actuarial gains previously recorded in accumulated other comprehensive loss.

Net periodic benefit income of \$9.1 million, excluding the amounts discussed above, was included in other expense, net for 2018 as a result of the adoption of ASU No. 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. Other expense, net for 2017 was recast to include \$5.6 million of net periodic benefit income as a result of the new guidance. See the discussion under Recent Accounting Pronouncements in Note 2 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for further information regarding the adoption of this new accounting guidance.

Foreign exchange losses of \$29.9 million were included in other expense, net for 2018 compared to foreign exchange losses of \$8.7 million for 2017. The 2018 amount included a \$14.0 million pretax loss related to foreign currency translation adjustments previously reported in accumulated other comprehensive loss that were recognized in other expense, net due to the liquidation of a foreign subsidiary.

The change in other expense, net for 2018 compared to the prior year was also impacted by a redemption premium of \$14.8 million incurred during the first quarter of 2017 in connection with the redemption of the 2020 Notes, partially offset by \$9.0 million in gains recognized during 2017 related to the sale of our investment in Hydrogenics Corporation.

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Income tax expense. On December 22, 2017, the U.S. government enacted tax reform legislation (U.S. tax reform) that reduced the corporate income tax rate from 35% to 21% and included a broad range of complex provisions affecting the taxation of businesses. Generally, financial statement recognition of the new legislation would be required to be completed in the period of enactment; however, in response to the complexities of this new legislation, the SEC staff issued Staff Accounting Bulletin No. 118 to provide companies with transitional relief. Specifically, while the initial accounting for items under the new legislation was incomplete, the guidance allowed the recognition of provisional amounts when reasonable estimates could be made or the continued application of the prior tax law if a reasonable estimate of the effect could not be made. The SEC staff provided up to one year for companies to finalize the accounting for the effects of this new legislation. During 2018, we recognized \$7.8 million of tax benefit related to changes made to the provisional amounts, primarily related to our transition tax and from revaluing our U.S. deferred tax assets and liabilities.

The effective income tax rate of 17.9% for 2018 was lower than the statutory rate of 21.0% primarily due to a reduction in tax expense of \$23.3 million related to the expiration of statutes of limitations on various uncertain tax positions, the \$7.8 million benefit recorded for changes to the provisional amounts as indicated above and the favorable impact of \$4.6 million of excess tax benefits related to equity-based compensation awards for 2018. These decreases to the effective tax rate were partially offset by an increase in tax expense due to the effect of the provision for state income taxes, the impact of earnings in foreign jurisdictions that are taxed at rates higher than the U.S., the impact of the new U.S. anti-deferral provisions and the impact of repatriation taxes.

Our effective income tax rate of 7.6% for 2017 reflected the impact of U.S. tax reform enacted in December 2017. Our effective income tax rate was also favorably affected by changes in tax legislation in certain other jurisdictions and a reduction in tax expense related to the expiration of statutes of limitations on various uncertain tax positions. In addition, the effective tax rate was favorably affected by \$14.4 million of excess tax benefits related to equity-based compensation awards for 2017.

Segment Results

	Year Ended December 31, 2018		2017		\$	%	Change	%
	% of		% of					
	Amount	Sales	Amount	Sales				
Net sales by segment:								
CCS	\$2,812.7	61.6 %	\$2,809.8	61.6 %	\$2.9	0.1	%	
CMS	1,755.8	38.4	1,750.8	38.4	5.0	0.3		
Consolidated net sales	\$4,568.5	100.0 %	\$4,560.6	100.0 %	\$7.9	0.2	%	
Operating income by segment:								
CCS	\$271.9	9.7 %	\$239.0	8.5 %	\$32.9	13.8	%	
CMS	178.1	10.1	233.0	13.3	(54.9)	(23.6))
Consolidated operating income	\$450.0	9.9 %	\$472.0	10.3 %	\$(22.0)	(4.7)	%)
Non-GAAP adjusted operating income by segment:								
CCS	\$521.8	18.6 %	\$523.3	18.6 %	\$(1.5)	(0.3)	%)

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CMS	316.2	18.0	353.4	20.2	(37.2)	(10.5)
Non-GAAP consolidated adjusted						
operating income ⁽¹⁾	\$838.0	18.3 %	\$876.7	19.2 %	\$(38.7)	(4.4)%

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(1) See “Reconciliation of Non-GAAP Measures” within this Management’s Discussion and Analysis of Financial Condition and Results of Operations, below.

CommScope Connectivity Solutions Segment

CCS segment net sales were relatively unchanged in 2018 compared to 2017. Net sales increased in the EMEA region primarily due to favorable foreign exchange rate changes for 2018. Net sales also increased in the U.S. for 2018, driven by incremental net sales due to the acquisition of Cable Exchange on August 1, 2017. These increases were mostly offset by reductions in certain selling prices in the U.S. as well as decreases in net sales in the APAC region and in Canada. Despite higher sales volumes, net sales in the CALA region were unchanged in 2018 due to unfavorable foreign exchange rate changes.

CCS segment operating income increased during 2018 compared to the prior year while non-GAAP adjusted operating income decreased slightly. CCS segment operating income benefitted from lower integration costs and restructuring costs offset by the impairment of our equity investment in a privately-owned entity in 2018, all of which are excluded from non-GAAP adjusted operating income. Both operating income and non-GAAP adjusted operating income benefitted from higher sales volumes, favorable product and geographic mix and cost savings initiatives that were partially offset by selling price reductions, higher material costs and unfavorable foreign exchange rate changes impacting costs. See “Reconciliation of Non-GAAP Measures” within this Management’s Discussion and Analysis of Financial Condition and Results of Operations, below.

We expect demand for our indoor network CCS products to be driven by global information technology spending, particularly for hyperscale and cloud data center networks, as the ongoing need for bandwidth and intelligence in the network continues to create demand for high-performance connectivity solutions. We expect demand for our outdoor network CCS products to be driven by global deployment of fiber-optic solutions for fiber-to-the-X applications, new services, densification, competitive dynamics in the access market, ongoing maintenance requirements of cable networks and residential construction market activity in North America. Spending patterns by service providers and data center customers can be volatile. Uncertain global economic conditions, variability in the levels of commercial and residential construction activity, consolidation among service providers, uncertain levels of information technology spending and reductions in the levels of distributor inventories may negatively affect demand for our products. The increasing demand for fiber solutions is expected to be somewhat offset by decelerating demand for copper solutions in networks. We expect modest near-term net sales growth in the CCS segment as a result of these business dynamics as well as ongoing pricing pressure.

CommScope Mobility Solutions Segment

CMS segment net sales were relatively unchanged during 2018 compared to 2017. The CMS segment saw higher sales volumes in the U.S. primarily as a result of government initiatives to promote the expansion of wireless networks. The increase in U.S. sales volumes was offset partially by reductions in certain selling prices. The increase in CMS segment net sales in the U.S. was largely offset by decreases in the APAC region. Foreign exchange rate changes were not significant to CMS segment net sales for 2018.

CMS segment operating income and non-GAAP adjusted operating income decreased in 2018 primarily due to selling price reductions and unfavorable foreign exchange rate changes impacting costs, partially offset by favorable product and geographic mix and higher sales volumes. CMS segment operating income was also impacted by higher restructuring costs and the impairment of our equity investment in a privately-owned entity in 2018, which are both excluded from non-GAAP adjusted operating income. See “Reconciliation of Non-GAAP Measures” within this Management’s Discussion and Analysis of Financial Condition and Results of Operations, below.

Our sales to wireless operators are volatile. We expect longer-term demand for our CMS products to be positively affected by wireless coverage and capacity expansion in emerging markets and growth in mobile data services and network capacity requirements in developed markets. In addition, we expect demand for our CMS products to continue to be favorably affected by government initiatives to promote the expansion of wireless networks (e.g., FirstNet), new spectrum deployments (e.g., Citizen's Broadband Radio Service or CBRS) and a venue refresh cycle over the next couple of years. We also expect longer-term demand for our CMS products to be positively affected by the introduction of 5G technology. In preparation for 5G networks, we continue to invest heavily in R&D, support customer trials and participate in industry forums to help shape 5G standards. Uncertainty in the global economy or a particular region or consolidation among or other investments by wireless operators may slow the growth or cause a decline in capital spending by wireless operators and negatively impact our net sales. We expect modest near-term net sales growth in the CMS segment as a result of these business dynamics as well as ongoing pricing pressure.

Comparison of results of operations for the year ended December 31, 2017 with the year ended December 31, 2016

	Year Ended December 31,				\$	%
	2017	2016	% of Net	% of Net		
	Amount	Sales	Amount	Sales	Change	Change
	(dollars in millions, except per share amounts)					
Net sales	\$4,560.6	100.0%	\$4,923.6	100.0%	\$(363.0)	(7.4)%
Gross profit	1,767.8	38.8	2,029.3	41.2	(261.5)	(12.9)
Operating income	472.0	10.3	567.6	11.5	(95.6)	(16.8)
Non-GAAP adjusted operating income ⁽¹⁾	876.7	19.2	1,044.2	21.2	(167.5)	(16.0)
Net income	193.8	4.2	222.8	4.5	(29.0)	(13.0)
Diluted earnings per share	\$0.98		\$1.13		\$(0.15)	(13.3)

(1) See "Reconciliation of Non-GAAP Measures" within this Management's Discussion and Analysis of Financial Condition and Results of Operations, below.

Net sales

	Year Ended		\$	%
	December 31, 2017	December 31, 2016		
	(dollars in millions)			
Net sales	\$4,560.6	\$4,923.6	\$(363.0)	(7.4)%
Domestic net sales	2,449.4	2,634.9	(185.5)	(7.0)
International net sales	2,111.2	2,288.7	(177.5)	(7.8)

Net sales. Net sales for 2017 were lower across all regions compared to the prior year except the EMEA region, with the U.S. and APAC region having the largest declines. Net sales to customers located outside of the U.S. comprised 46% of total net sales for both 2017 and 2016. Foreign exchange rate changes did not significantly impact net sales for

2017 compared to 2016.

From a segment perspective, CCS segment net sales decreased by 5.3% and CMS segment net sales decreased by 10.6% for 2017 compared to the prior year due to lower sales in both domestic and international markets. For further details by segment, see the section titled “Segment Results” below.

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Gross profit, SG&A expense and R&D expense

	Year Ended		\$	%
	December 31, 2017	2016		
	(dollars in millions)			
Gross profit	\$1,767.8	\$2,029.3	\$(261.5)	(12.9)%
As a percent of sales	38.8%	41.2%		
SG&A expense	795.4	881.7	(86.3)	(9.8)
As a percent of sales	17.4%	17.9%		
R&D expense	185.6	201.3	(15.7)	(7.8)
As a percent of sales	4.1%	4.1%		

Gross profit (net sales less cost of sales). The decrease in gross profit for 2017 compared to 2016 was mainly driven by decreases in sales volume, reductions in price, unfavorable geographic and product mix and higher material costs. This decrease was partially offset by the favorable impact of cost reduction initiatives.

Selling, general and administrative expense. SG&A expense for 2017 was lower than 2016 due primarily to lower incentive compensation expense and benefits from cost reduction initiatives. Despite lower net sales, SG&A expense as a percentage of sales decreased from 2016 as a result of these lower costs.

Research and development. R&D expense decreased for 2017 compared to 2016 primarily as a result of lower incentive compensation expense. R&D expense as a percentage of sales remained unchanged from 2016.

Amortization of purchased intangible assets, Restructuring costs and Asset impairments

	Year Ended		\$	%
	December 31, 2017	2016		
	(dollars in millions)			
Amortization of purchased intangible assets	\$271.0	\$297.2	\$(26.2)	(8.8)%
Restructuring costs, net	43.8	42.9	0.9	2.1
Asset impairments	—	38.6	(38.6)	(100.0)

Amortization of purchased intangible assets. The amortization of purchased intangible assets was lower for 2017 compared to 2016 primarily because certain of our intangible assets became fully amortized. This was partially offset by the amortization of intangible assets related to the Cable Exchange acquisition.

Restructuring costs, net. The restructuring costs for 2017 and 2016 were primarily related to the continuing integration of the BNS acquisition.

Asset impairments. We did not record any asset impairment charges during 2017. During 2016, we recorded impairment charges of \$15.0 million within the CCS segment due to the revised business plan for a product line that indicated its intangible assets would not be recoverable. Also during 2016, we recorded impairment charges of \$8.3 million related to certain long-lived assets acquired with the BNS business that were no longer expected to be utilized

in operations within the CCS segment. In addition to these intangible asset and long-lived asset impairment charges, 2016 included a \$15.3 million goodwill impairment charge in the CCS segment as a result of the impairment analysis required by the change in reportable segments.

Net interest expense, Other expense, net and Income taxes

	Year Ended			
	December 31,		\$	%
	2017	2016	Change	Change
	(dollars in millions)			
Net interest expense	\$(252.8)	\$(272.0)	\$ 19.2	(7.1)%
Other expense, net	(9.5)	(23.1)	13.6	(58.9)
Income tax expense	(16.0)	(49.7)	33.7	(67.8)

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Net interest expense. The decrease in net interest expense for 2017 as compared to 2016 resulted primarily from decreases in our long-term debt due to our debt redemptions and repayments in 2017 and 2016. Our average long-term debt outstanding decreased by more than \$400.0 million for 2017 as compared to 2016. During 2017, the reduction in interest expense was offset partially by the write-off of \$14.1 million of debt issuance costs and original issue discount in connection with the redemption of \$500.0 million of the 2020 Notes and the prepayment of \$460.0 million of senior secured term loans. The redemption of the 2020 Notes and the prepayment of the senior secured term loans were substantially funded by the issuance of the 2027 Notes in March 2017.

During 2016, we repaid \$150.0 million of our senior secured term loan due in 2018 and voluntarily redeemed \$536.6 million of the 6.625%/7.375% senior payment-in-kind toggle notes (the senior PIK toggle notes). In connection with the repayment and redemption, we wrote off \$7.1 million of debt issuance costs and original issue discount to interest expense during 2016.

Our weighted average effective interest rate on outstanding borrowings, including the amortization of debt issuance costs and original issue discount, was 5.45% at December 31, 2017 and 5.24% at December 31, 2016.

Other expense, net. In connection with the redemption of the 2020 Notes during 2017, we paid a redemption premium of \$14.8 million which was included in other expense, net. In May 2017, we amended the 2022 Term Loan to reduce the interest rate margin, and in connection with the amendment, we incurred debt modification costs of \$1.1 million which were included in other expense, net for 2017. In connection with the debt redeemed or repaid during 2016, we incurred redemption premiums of \$17.7 million and other fees of \$1.2 million which were included in other expense, net.

Foreign exchange losses of \$8.7 million were included in other expense, net for 2017 compared to losses of \$9.5 million for 2016.

During 2017, we sold the remainder of our investment in Hydrogenics resulting in pretax gains of \$9.0 million which were recorded in other expense, net. During 2016, sales of Hydrogenics shares resulted in pretax gains of \$1.2 million.

Income tax expense. Our effective income tax rate of 7.6% for 2017 reflected the impact of U.S. tax reform enacted in December 2017. Our effective income tax rate was also favorably affected by changes in tax legislation in certain other jurisdictions and a reduction in tax expense related to the expiration of statutes of limitations on various uncertain tax positions. The effective tax rate was also favorably affected by \$14.4 million of excess tax benefits related to equity-based compensation awards for 2017.

Our effective income tax rate of 18.2% for 2016 was lower than the statutory rate of 35% primarily due to a reduction in tax expense related to the release of valuation allowances related to certain federal tax credit carryforwards and certain other deferred tax assets. The effective income tax rate was also favorably affected by the reduction of reserves for uncertain tax positions and earnings in foreign jurisdictions that we did not plan to repatriate. These foreign earnings were generally taxed at rates lower than the U.S. Offsetting these decreases in 2016 was the effect of the provision for state income taxes as well as the goodwill impairment charge for which only partial tax benefits were recorded.

Segment Results

	Year Ended December 31, 2017		2016		\$	%
	Amount	% of Sales Net	Amount	% of Sales Net		
	(dollars in millions)				Change	Change
Net sales by segment:						
CCS	\$2,809.8	61.6 %	\$2,965.5	60.2 %	\$(155.7)	(5.3)%
CMS	1,750.8	38.4	1,958.1	39.8	(207.3)	(10.6)
Consolidated net sales	\$4,560.6	100.0 %	\$4,923.6	100.0 %	\$(363.0)	(7.4)%
Operating income by segment:						
CCS	\$239.0	8.5 %	\$287.4	9.7 %	\$(48.4)	(16.8)%
CMS	233.0	13.3	280.2	14.3	(47.2)	(16.8)
Consolidated operating income	\$472.0	10.3 %	\$567.6	11.5 %	\$(95.6)	(16.8)%
Non-GAAP adjusted operating income by segment:						
CCS	\$523.3	18.6 %	\$628.5	21.2 %	\$(105.2)	(16.7)%
CMS	353.4	20.2	415.7	21.2	(62.3)	(15.0)
Non-GAAP consolidated adjusted operating income ⁽¹⁾	\$876.7	19.2 %	\$1,044.2	21.2 %	\$(167.5)	(16.0)%

(1) See “Reconciliation of Non-GAAP Measures” within this Management’s Discussion and Analysis of Financial Condition and Results of Operations, below.

CommScope Connectivity Solutions Segment

CCS segment net sales were lower in 2017 compared to 2016 in all regions except the EMEA region. The decrease was driven by the U.S. and the APAC region as a result of a slowdown in the rollout of new projects by certain North American service providers, continued weakness in demand for our indoor network products, and certain large projects in the APAC region in 2016 that did not recur in 2017. In addition, we experienced BNS integration issues early in 2017 that negatively affected customer service levels and order rates. Incremental sales related to the Cable Exchange acquisition completed in August 2017 were not material to the CCS segment for 2017. Foreign exchange rate changes did not significantly impact segment sales for 2017 compared to 2016.

CCS segment operating income and non-GAAP adjusted operating income decreased for 2017 compared to 2016 primarily due to lower sales volumes, price reductions, unfavorable geographic and product mix and higher material costs. These decreases were partially offset by the favorable impact of cost reduction initiatives and lower incentive compensation. The decrease in CCS segment operating income was also partially offset by lower intangible asset amortization, lower impairment charges and lower integration and transaction costs during 2017 compared to 2016. The impacts of intangible asset amortization, impairment charges and integration and transaction costs are excluded

from the calculation of non-GAAP adjusted operating income.

CommScope Mobility Solutions Segment

The CMS segment experienced a decrease in net sales for 2017 compared to 2016 in all major regions, with the decrease being most pronounced in the U.S. and the APAC region. While CMS segment net sales benefited from increased spending by certain domestic operators in the first quarter of 2017, we saw a slowdown in their spending during the remainder of 2017. The decline in sales of our CMS products in the APAC region was primarily due to certain large projects in 2016 that did not recur during 2017. Foreign exchange rate changes did not significantly impact segment sales for 2017 compared to 2016.

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CMS segment operating income and non-GAAP adjusted operating income decreased for 2017 compared to 2016 primarily due to lower sales volumes, price reductions and unfavorable geographic mix, partially offset by lower incentive compensation. The decrease in CMS segment operating income for 2017 compared to 2016 was partially offset by lower intangible amortization and restructuring costs. Non-GAAP adjusted operating income excludes the impacts of intangible amortization and restructuring costs.

Liquidity and Capital Resources

The following table summarizes certain key measures of our liquidity and capital resources:

	December 31,		\$	%
	2018	2017	Change	Change
	(dollars in millions)			
Cash and cash equivalents	\$458.2	\$454.0	\$4.2	0.9 %
Working capital ⁽¹⁾ , excluding cash and cash equivalents and current portion of long-term debt	729.0	766.2	(37.2)	(4.9)
Availability under revolving credit facility	463.1	425.4	37.7	8.9
Long-term debt, including current portion	3,985.9	4,369.4	(383.5)	(8.8)
Total capitalization ⁽²⁾	5,742.7	6,017.2	(274.5)	(4.6)
Long-term debt, including current portion, as a percentage of total capitalization	69.4 %	72.6 %		

(1) Working capital consists of current assets of \$1,877.8 million less current liabilities of \$690.6 million as of December 31, 2018 and current assets of \$1,943.9 million less current liabilities of \$723.7 million as of December 31, 2017.

(2) Total capitalization includes long-term debt, including the current portion, and stockholders' equity. Our principal sources of liquidity on a short-term basis are cash and cash equivalents, cash flows provided by operations and availability under credit facilities. Refer to Note 6 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for information regarding the terms of our credit agreements as of December 31, 2018. To fund the Pending Acquisition, on February 19, 2019 we issued \$1.25 billion of 5.50% senior secured notes due 2024, \$1.5 billion of 6.00% senior secured notes due 2026 and \$1.0 billion of 8.25% senior unsecured notes due 2027 and priced the borrowing of \$3.2 billion under a new senior secured term loan due 2026 with an interest rate of LIBOR plus 3.25%. The proceeds of the notes were placed into escrow and will be released upon consummation of the Pending Acquisition, and it is expected that the new senior secured term loan will be borrowed at closing of the Pending Acquisition. We expect to use a portion of the new senior secured term loan to pay off our existing senior secured term loan due December 2022. We also expect to enter into a new asset-based revolving credit facility in an amount of up to \$1.0 billion, subject to borrowing base capacity. In addition to the new debt, we expect to fund the Pending Acquisition by issuing 1.0 million shares of series A convertible preferred stock to the Carlyle Group for \$1,000 per share, or an aggregate investment of \$1.0 billion. On a long-term basis, our potential sources of liquidity include raising capital through additional issuances of debt and/or equity.

In addition to funding the pending ARRIS acquisition, the primary uses of liquidity include debt service requirements, funding working capital requirements, capital expenditures, paying restructuring and integration costs, income tax payments and funding pension benefits. We believe that our existing cash, cash equivalents and cash flows from

operations, combined with the long-term borrowings incurred for the pending ARRIS acquisition, availability under our current and future revolving credit facility and access to capital markets, will be sufficient to meet our presently anticipated future cash needs. We may experience volatility in cash flows between periods due to, among other reasons, variability in the timing of vendor payments and customer receipts. We may, from time to time, borrow under our revolving credit facility or issue securities, if market conditions are favorable, to meet future cash needs or to reduce our borrowing costs.

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Although there are no financial maintenance covenants under the terms of our senior notes, there is a limitation, among other limitations, on certain future borrowings based on an adjusted leverage ratio or a fixed charge coverage ratio. These ratios are based on financial measures similar to adjusted EBITDA as presented in the “Reconciliation of Non-GAAP Measures” section below, but also give pro forma effect to certain events, including acquisitions and savings from cost reduction initiatives such as facility closures and headcount reductions. For the year ended December 31, 2018, our pro forma adjusted EBITDA, as measured pursuant to the indentures governing our notes, was \$951.5 million, which included \$37.9 million of savings from announced cost reduction initiatives so that the impact of the cost reduction initiatives is fully reflected in the twelve-month period used in the calculation of the ratios. In addition to limitations under these indentures, our senior secured credit facilities contain customary negative covenants. We believe we are in compliance with the covenants under our indentures and senior secured credit facilities at December 31, 2018.

Cash and cash equivalents increased slightly during 2018. We generated less cash from operations and had higher capital expenditures in 2018 compared to 2017. However, in 2017 we used cash on hand to fund our purchase of Cable Exchange for \$105.2 million. In 2018, we made net voluntary repayments of \$400.0 million on the 2022 Term Loan while in 2017 we made \$210.0 million in voluntary repayments of debt and repurchased \$175.0 million of our common stock. As of December 31, 2018, approximately 70% of our cash and cash equivalents were held outside the U.S.

Working capital, excluding cash and cash equivalents, decreased during 2018. The decrease was mainly due to lower accounts receivable balances due to the timing of net sales. This decrease was partially offset by lower accounts payable balances and higher inventory balances as of December 31, 2018 compared to December 31, 2017. The net reduction in total capitalization during 2018 reflected the repayment of \$400.0 million on the 2022 Term Loan and foreign currency translation losses partially offset by current year earnings.

Cash Flow Overview

Comparison for the year ended December 31, 2018 with the year ended December 31, 2017

	Year Ended			
	December 31,	December 31,	\$	%
	2018	2017	Change	Change
	(dollars in millions)			
Net cash generated by operating activities	\$494.1	\$586.3	\$(92.2)	(15.7)%
Net cash used in investing activities	(64.3)	(166.2)	101.9	NM
Net cash used in financing activities	(409.6)	(413.6)	4.0	NM

NM - Not meaningful

Operating Activities

During 2018, we generated \$494.1 million of cash through operating activities compared to \$586.3 million during 2017. The lower level of cash generation was primarily due to lower earnings, increases in cash used to build inventory and higher cash payments for interest and taxes. The decreases were offset partially by lower payments of incentive compensation compared with the prior year.

Investing Activities

Investment in property, plant and equipment during 2018 was \$82.3 million compared with \$68.7 million for the prior year. The investment in property, plant and equipment was primarily related to supporting improvements in manufacturing operations, including expanding production capacity and investing in information technology, including software developed for internal use.

During 2018 and 2017, we sold property and equipment no longer being utilized for \$12.9 million and \$5.4 million, respectively.

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During 2018 and 2017, we received \$5.1 million and paid \$7.6 million, respectively, to settle net investment hedges that we entered into for the purpose of mitigating a portion of the foreign currency risk on the euro net investment in a foreign subsidiary.

During 2017, we acquired Cable Exchange and paid \$105.2 million, net of cash acquired, using cash on hand. Also during 2017, we received proceeds of \$9.9 million related to the sale of the remainder of our investment in Hydrogenics.

Financing Activities

In July 2018, we repaid \$400.0 million of the 2022 Term Loan. The payment was made using \$250.0 million of cash on hand and \$150.0 million borrowed under our asset-based revolving credit facility (the revolving credit facility) which was repaid during the third quarter of 2018. As of December 31, 2018, we had no outstanding borrowings under the revolving credit facility and the remaining availability was \$463.1 million, reflecting a borrowing base of \$492.6 million reduced by \$29.5 million of letters of credit issued under the revolving credit facility. During 2018, we received proceeds of \$6.1 million related to the exercise of stock options. Also during 2018, employees surrendered 407,938 shares of our common stock to satisfy their tax withholding requirements on vested restricted stock units and performance share units, which reduced cash flows by \$15.7 million.

During 2017, we issued the 2027 Notes for \$750.0 million and the proceeds, together with cash on hand, were used to (i) redeem all \$500.0 million of the outstanding 2020 Notes, (ii) repay a portion of the outstanding borrowings under our senior secured term loans, including \$111.9 million of outstanding principal on our senior secured term loan due 2018 and \$138.1 million of outstanding principal on the 2022 Term Loan, and (iii) pay related fees and expenses. We paid a \$14.8 million premium to redeem the 2020 Notes and paid \$7.2 million in debt issuance costs related to the 2027 Notes. In addition, during 2017, we amended the 2022 Term Loan to reduce the interest rate margin by 50 basis points which resulted in the repayment of \$30.4 million to certain lenders under the senior secured credit facilities and the receipt of \$30.4 million in proceeds from the new lenders and existing lenders who increased their positions. We also paid \$1.1 million in debt modification costs related to this amendment. Also during 2017, we voluntarily repaid \$210.0 million of the 2022 Term Loan. During 2017, we paid cash of \$175.0 million to repurchase stock under stock repurchase programs authorized by our Board of Directors in 2017. The repurchase authorization expired on July 31, 2018. In addition, we received proceeds of \$9.9 million related to the exercise of stock options and employees surrendered 411,932 shares of our common stock to satisfy their tax withholding requirements on vested restricted stock units, which reduced cash flows by \$15.4 million.

Comparison for the year ended December 31, 2017 with the year ended December 31, 2016

	Year Ended		\$	%
	December 31, 2017	December 31, 2016		
	(dollars in millions)			
Net cash generated by operating activities	\$586.3	\$640.2	\$(53.9)	(8.4)%
Net cash used in investing activities	(166.2)	(54.6)	(111.6)	NM
Net cash used in financing activities	(413.6)	(708.4)	294.8	NM

NM - Not meaningful

Operating Activities

During 2017, we generated \$586.3 million of cash through operating activities compared to \$640.2 million during 2016. The lower level of cash generation was primarily due to the prior year benefit generated from the extension of vendor payment terms as well as higher 2016 incentive compensation which was paid in 2017 and lower operating performance in 2017 compared to 2016. These declines were partially offset by higher cash flow from accounts receivable due to changes in the timing of sales and collections as well as approximately \$59.2 million of customer payments received in late 2017 that were not due until 2018. In addition, we paid lower cash taxes and cash interest during 2017 than in 2016.

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Investing Activities

During 2017, we acquired Cable Exchange and paid \$105.2 million, net of cash acquired, using cash on hand. We recorded a noncurrent liability for the remaining \$14.5 million of payments due to the sellers. During 2016, we received adjustments to the BNS acquisition purchase price of \$7.1 million and paid \$1.0 million as a final payment on a previous acquisition.

Investment in property, plant and equipment during 2017 was \$68.7 million compared with \$68.3 million for the prior year. The investment in property, plant and equipment was primarily related to supporting improvements in manufacturing operations, including expanding production capacity and investing in information technology, including software developed for internal use.

During 2017, we received proceeds of \$9.9 million related to the sale of the remainder of our investment in Hydrogenics. During 2016, we received \$1.3 million in proceeds related to the sale of a portion of that investment.

During 2017, we paid \$7.6 million to settle a net investment hedge that we entered into in 2017 for the purpose of mitigating a portion of the foreign currency risk on the euro net investment in a foreign subsidiary. As of December 31, 2017, we had entered into another net investment hedge intended to mitigate the same risk with an outstanding maturity of twelve months.

During 2017 and 2016, we sold properties no longer being utilized for \$4.5 million and \$3.7 million, respectively.

Financing Activities

In March 2017, we issued the 2027 Notes for \$750.0 million and the proceeds, together with cash on hand, were used to (i) redeem all \$500.0 million of the outstanding 2020 Notes, (ii) repay a portion of the outstanding borrowings under our senior secured term loans, including the \$111.9 million of outstanding principal on our senior secured term loan due 2018 and \$138.1 million of outstanding principal on the 2022 Term Loan, and (iii) pay related fees and expenses. We paid a \$14.8 million premium to redeem the 2020 Notes and paid \$7.2 million in debt issuance costs related to the 2027 Notes.

During 2017, we amended the 2022 Term Loan to reduce the interest rate margin by 50 basis points which resulted in the repayment of \$30.4 million to certain lenders under the senior secured credit facilities and the receipt of \$30.4 million in proceeds from the new lenders and existing lenders who increased their positions. We also paid \$1.1 million in debt modification costs related to this amendment. In addition, we voluntarily repaid \$210.0 million of the 2022 Term Loan during 2017.

As of December 31, 2017, we had no outstanding borrowings under our revolving credit facility and the remaining availability was \$425.4 million, reflecting a borrowing base of \$452.4 million reduced by \$27.0 million of letters of credit issued under the revolving credit facility.

During the first half of 2017, we paid cash of \$100.0 million to repurchase stock under the stock repurchase program authorized by our Board of Directors in February 2017. We had no remaining authorization under this stock repurchase program as of December 31, 2017. In August 2017, our Board of Directors approved a new stock repurchase plan of up to \$100.0 million. We paid cash of \$75.0 million to repurchase stock under this plan during 2017. We had \$25.0 million of remaining authorization under this stock repurchase program as of December 31, 2017. The repurchase authorization under this plan expired on July 31, 2018.

During 2017, we received proceeds of \$9.9 million related to the exercise of stock options. Also during 2017, employees surrendered 411,932 shares of our common stock to satisfy their tax withholding requirements on vested restricted stock units and performance share units, which reduced cash flows by \$15.4 million.

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During 2016, we voluntarily redeemed the remaining \$536.6 million of our senior PIK toggle notes and made mandatory debt repayments of \$12.5 million on the 2022 Term Loan. In connection with the debt redeemed or repaid in 2016, we paid redemption premiums of \$17.7 million and other fees of \$1.2 million. Also during 2016, we received proceeds of \$16.8 million related to the exercise of stock options and employees surrendered 143,000 shares of our common stock to satisfy their tax withholding requirements on vested restricted stock units, which reduced cash flows by \$3.9 million.

Reconciliation of Non-GAAP Measures

We believe that presenting certain non-GAAP financial measures enhances an investor's understanding of our financial performance. We further believe that these financial measures are useful in assessing our operating performance from period to period by excluding certain items that we believe are not representative of our core business. We also use certain of these financial measures for business planning purposes and in measuring our performance relative to that of our competitors. We believe these financial measures are commonly used by investors to evaluate our performance and the performance of our competitors. However, our use of the terms non-GAAP adjusted operating income and non-GAAP adjusted EBITDA may vary from that of others in our industry. These financial measures should not be considered as alternatives to operating income (loss), net income (loss) or any other performance measures derived in accordance with U.S. GAAP as measures of operating performance, operating cash flows or liquidity.

Consolidated

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Operating income	\$450.0	\$472.0	\$567.6
Adjustments:			
Amortization of purchased intangible			
assets	264.6	271.0	297.2
Restructuring costs, net	44.0	43.8	42.9
Equity-based compensation	44.9	41.9	35.0
Asset impairments	15.0	—	38.6
Integration and transaction costs (a)	19.5	48.0	62.3
Purchase accounting adjustments (b)	—	—	0.6
Non-GAAP adjusted operating income	\$838.0	\$876.7	\$1,044.2
Depreciation	75.6	81.7	80.5
Non-GAAP adjusted EBITDA	\$913.6	\$958.4	\$1,124.6

(a) Reflects integration costs related to the acquisition of the BNS business, transaction costs related to potential and consummated acquisitions and costs related to secondary stock offerings.

(b) Reflects non-cash charges resulting from the application of acquisition accounting.

CCS Segment

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Operating income	\$271.9	\$239.0	\$287.4
Adjustments:			
Amortization of purchased intangible assets	178.6	175.5	195.9
Restructuring costs, net	24.2	36.6	27.1
Equity-based compensation	27.3	24.4	19.8
Asset impairments	7.5	—	38.6
Integration and transaction costs	12.3	47.9	59.1
Purchase accounting adjustments	—	—	0.6
Non-GAAP adjusted operating income	\$521.8	\$523.3	\$628.5

CMS Segment

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Operating income	\$178.1	\$233.0	\$280.2
Adjustments:			
Amortization of purchased intangible assets	86.0	95.5	101.3
Restructuring costs, net	19.8	7.2	15.8
Equity-based compensation	17.6	17.5	15.2
Asset impairments	7.5	—	—
Integration and transaction costs	7.3	0.2	3.3
Non-GAAP adjusted operating income	\$316.2	\$353.4	\$415.7

Note: Components may not sum to total due to rounding

Contractual Obligations

The following table summarizes our contractual obligations as of December 31, 2018:

Contractual Obligations	Amount of Payments Due per Period				
	Total				
	Payments Due (in millions)	2019	2020-2021	2022-2023	Thereafter
Long-term debt, including current maturities (a)	\$4,036.3	\$—	\$ 650.0	\$ 486.3	\$ 2,900.0
Interest on long-term debt (a)(b)	1,258.9	219.1	419.9	348.5	271.4
Operating leases	119.7	35.7	53.4	19.3	11.3
Purchase obligations and other supplier agreements (c)	36.4	32.8	3.6	—	—
Pension and other postretirement benefit liabilities (d)	8.7	5.6	1.0	0.8	1.3
Restructuring costs, net (e)	29.2	27.7	1.5	—	—
Unrecognized tax benefits (f)	—	—	—	—	—
Total contractual obligations	\$5,489.2	\$320.9	\$ 1,129.4	\$ 854.9	\$ 3,184.0

- (a) No prepayment or redemption of any of our long-term debt balances has been assumed. Refer to Note 6 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for information regarding the terms of our long-term debt agreements.
- (b) Interest on long-term debt excludes the amortization of debt issuance costs and original issue discount. Interest on variable rate debt is estimated based upon rates in effect as of December 31, 2018.
- (c) Purchase obligations and other supplier agreements include payments of \$21.7 million due in 2019 for minimum amounts owed under take-or-pay or requirements contracts. Amounts covered by open purchase orders are excluded as there is no contractual obligation until goods or services are received. This item also includes \$11.1 million and \$3.6 million of purchase price payments due in 2019 and 2020, respectively, related to the acquisition of Cable Exchange.
- (d) Amounts reflect expected contributions related to payments under the postretirement benefit plans through 2028 and expected pension contributions of \$5.0 million in 2019 (see Note 10 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K).
- (e) Future restructuring payments exclude payments due under lease arrangements which are included in operating leases above.
- (f) Due to the uncertainty in predicting the timing of tax payments related to our unrecognized tax benefits, \$17.3 million has been excluded from the presentation. We anticipate a reduction of up to \$5.0 million of unrecognized tax benefits during the next twelve months (see Note 11 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K).

Recent Accounting Pronouncements

Adopted in 2018

In the fourth quarter of 2018, we early adopted ASU No. 2018-14, Disclosure Framework: Changes to the Disclosure Requirements for Defined Benefit Plans, which adds disclosure requirements identified as relevant for employers that sponsor defined benefit pension or other postretirement plans, removes disclosures that are no longer considered cost beneficial, and clarifies existing guidance for certain disclosure requirements. The impact on our disclosures was to remove the disclosure of the amounts in accumulated other comprehensive loss expected to be recognized as net periodic benefit cost in the next year and to provide explanations of significant gains and losses related to the changes in the benefit obligation for the period. The impacts were applied retrospectively to the disclosures for all periods presented. The adoption of this ASU only affected the disclosures on our defined benefit pension plans and did not affect our consolidated financial statements. See Note 10 in the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for further discussion of our defined benefit pension plans.

In the fourth quarter of 2018, we early adopted ASU No. 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income, which allows companies to elect reclassification from accumulated other comprehensive income to retained earnings for certain tax effects resulting from the U.S. tax legislation enacted in 2017. Our policy is to generally recognize the tax effects in accumulated other comprehensive income at the currently enacted tax rate and reclassify it to net income in the same period that the related pre-tax accumulated comprehensive income reclassifications are recognized. We did not elect the permitted reclassification and therefore adoption did not have an impact on our consolidated financial statements.

We adopted ASU No. 2014-09, Revenue from Contracts with Customers, including all subsequently issued clarifying guidance, on January 1, 2018. The core principle of the new guidance is to recognize revenue when promised goods or services are transferred to customers in an amount that reflects the consideration that is expected to be received for those goods or services. We adopted the standard using the modified retrospective approach with the cumulative effect of applying the standard on the date of adoption recognized in retained earnings (accumulated deficit).

Revenue recognition for our product sales remained generally consistent with historical practice. However, the adoption of ASU No. 2014-09 resulted in acceleration of revenue recognition for certain project contracts containing integrated product and service obligations, primarily within the CMS segment. These multi-element contracts represented less than 2.0% of total net sales for the years ended December 31, 2018 and 2017. For these contracts, certain performance obligations are recognized over time using cost-based input methods, which recognize revenue and cost of sales based on the relationship between actual costs incurred compared to the total estimated cost for the performance obligation. Based on contracts in effect at January 1, 2018, we recorded a cumulative effect adjustment, net of tax, of \$3.4 million, which reduced the accumulated deficit on the Consolidated Balance Sheets. This adjustment reflects an acceleration of \$8.0 million of net sales.

The impact of adoption of the new revenue recognition standard on the consolidated financial statements was as follows:

Year Ended December 31, 2018		
As Reported	Amounts Without Adoption of	Effect of Change Increase / (Decrease)

		ASU No. 2014-09	
Net sales	\$4,568,507	\$4,572,634	\$ (4,127)
Cost of sales	2,880,223	2,881,920	(1,697)
Operating income	449,968	452,398	(2,430)
Income tax expense	30,495	31,117	(622)
Net income	140,217	142,025	(1,808)

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	As of December 31, 2018		
	As Reported	Amounts Without Adoption of ASU No. 2014-09	Effect of Change Increase / (Decrease)
Assets:			
Accounts receivable, less allowance	\$810,359	\$808,381	\$ 1,978
for doubtful accounts			
Inventories, net	473,327	475,008	(1,681)
Liabilities:			
Other accrued liabilities	291,385	292,693	(1,308)
Stockholders' equity:			
Retained earnings (accumulated deficit)	(249,777)	(251,382)	1,605

We adopted ASU No. 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities, on January 1, 2018. This new guidance modifies how entities measure equity investments (except those accounted for under the equity method of accounting) and present changes in the fair value of financial liabilities; simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify impairment; changes presentation and disclosure requirements; and clarifies that an entity should evaluate the need for a valuation allowance on a deferred tax asset related to available-for-sale securities in combination with the entity's other deferred tax assets. Adoption of this new guidance did not have a material impact on the consolidated financial statements.

We adopted ASU No. 2016-16, Accounting for Income Taxes, Intra-Entity Asset Transfers of Assets Other than Inventory, on January 1, 2018. Under previous guidance, the tax effects of intra-entity asset transfers were deferred until the transferred asset was sold to a third party or otherwise recovered through use. The new guidance eliminates the exception for all intra-entity sales of assets other than inventory. As a result, the tax effect of an intra-entity asset sale would be recognized when the transfer occurs. We recorded a cumulative effect adjustment of \$2.6 million as of January 1, 2018 that decreased the accumulated deficit on the Consolidated Balance Sheets as a result of this new guidance.

We adopted ASU No. 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, on January 1, 2018. The new standard requires an employer to report the service cost component of net periodic benefit cost in the same line item as other compensation costs arising from services rendered by the employee and requires the other components of net periodic benefit cost to be reported outside the subtotal of operating income. Of the total \$19.8 million of net periodic benefit cost for year ended December 31, 2018, \$15.7 million of net periodic benefit cost was recorded in other expense, net, and \$4.1 million of net periodic benefit cost was recorded within operating income. We utilized the practical expedient and used the amounts disclosed in our employee benefit plans note for the years ended December 31, 2017 and 2016 as the basis for applying the retrospective presentation requirements. We reclassified \$5.6 million and \$7.1 million of net periodic benefit income from operating income to other expense, net for the years ended December 31, 2017 and 2016, respectively. The adoption of this guidance had no impact on the previously reported income before income taxes or net income for the years ended December 31, 2017 and 2016.

We adopted ASU No. 2017-12, Targeted Improvements to Accounting for Hedging Activities, on January 1, 2018. The new guidance provides targeted improvements to the hedge accounting model intended to allow financial

reporting to more closely reflect an entity's risk management activities and to simplify the application of hedge accounting. Beginning January 1, 2018, we elected to assess the effectiveness of our net investment hedges using the spot rate method. As a result, differences between the spot rate and the forward rate will be amortized to earnings on a straight-line basis over the life of the contract. See Note 7 in the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for further details on our derivative and hedging activities and the related impacts to the financial statements.

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Issued but Not Adopted

In August 2018, the Financial Accounting Standards Board (FASB) issued ASU No. 2018-15, Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement (CCA) that is a Service Contract, which aligns the accounting for costs incurred to implement a CCA that is a service arrangement with the guidance on capitalizing costs associated with developing or obtaining internal-use software. ASU No. 2018-15 is effective for us as of January 1, 2020 and early adoption is permitted. We are evaluating the impact of the new guidance on the consolidated financial statements and when it will be adopted.

In January 2017, the FASB issued ASU No. 2017-04, Simplifying the Test of Goodwill Impairment, which eliminates Step 2 from the goodwill impairment test. Under the new guidance, an entity will perform its annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An entity will recognize a goodwill impairment charge for the excess of the reporting unit's carrying amount over its fair value, up to the amount of goodwill allocated to that reporting unit. ASU No. 2017-04 is effective for us as of January 1, 2020 and early adoption is permitted. We plan to adopt this new guidance as of January 1, 2019 and do not anticipate that adoption will materially affect the consolidated financial statements.

In June 2016, the FASB issued ASU No. 2016-13, Measurement of Credit Losses on Financial Instruments. The new guidance replaces the current incurred loss method used for determining credit losses on financial assets, including trade receivables, with an expected credit loss method. ASU No. 2016-13 is effective for us as of January 1, 2020 and early adoption is permitted. We are evaluating the impact of the new guidance on the consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which supersedes the current leasing guidance in Topic 840, Leases. Under the new guidance, lessees are required to recognize assets and lease liabilities for the rights and obligations created by leased assets previously classified as operating leases. ASU No. 2016-02 is effective for us as of January 1, 2019. In July 2018, the FASB issued ASU No. 2018-11, which allows entities a transition election to recognize the effects of applying the new leasing standard as a cumulative-effect adjustment to retained earnings (accumulated deficit) as opposed to restating comparative periods for the effects of applying the new standard. We expect to elect this transition approach. We are finalizing the necessary changes to our accounting policies, processes, internal controls and information systems that will be required to meet the new standard's reporting and disclosure requirements. The majority of our leased asset value relates to real estate with the remainder primarily related to vehicles and equipment. We estimate that adoption of the new standard will increase total assets and total liabilities in the Consolidated Balance Sheets by \$95 million to \$100 million due to the addition of right-of-use assets and lease obligations for operating type leases, net of the elimination of existing prepaid rent, deferred rent and lease termination cost amounts. We do not expect the adoption of the new standard to significantly affect the Consolidated Statements of Operations and Comprehensive Income or the Consolidated Statements of Cash Flows.

Off-Balance Sheet Arrangements

We are not a party to any significant off-balance sheet arrangements, except for operating leases. There have not been any material changes to our off-balance sheet arrangements during the year ended December 31, 2018.

Effects of Inflation and Changing Prices

We continually attempt to minimize the effect of inflation on earnings by controlling our operating costs and adjusting our selling prices. The principal raw materials purchased by us (copper, aluminum, steel, plastics and other polymers, bimetal and optical fiber) are subject to changes in market price as they are influenced by commodity markets and other factors. Prices for copper, fluoropolymers and certain other polymers derived from oil and natural gas have, at

times, been volatile. As a result, we have adjusted our prices for certain products and may have to adjust prices again in the future. To the extent that we are unable to pass on cost increases to customers without a significant decrease in sales volume or must implement price reductions in response to a rapid decline in raw material costs, these cost changes could have a material adverse impact on the results of our operations.

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ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risks related to changes in interest rates, foreign currency exchange rates and commodity prices. We may utilize derivative financial instruments, among other methods, to hedge some of these exposures. We do not use derivative financial instruments for speculative or trading purposes.

Interest Rate Risk

The table below summarizes the expected interest and principal payments associated with our variable rate debt (the \$486.3 million senior secured term loan and revolving credit facility) as of December 31, 2018. The principal payments presented below are based on scheduled maturities and assume no borrowings under the revolving credit facility. The interest payments presented below assume the interest rates in effect as of December 31, 2018 (see Note 6 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K). The impact of a 1% increase in the interest rate index on projected future interest payments on the variable rate debt is also included in the table below.

	2019	2020	2021	2022	2023	There- after
	(dollars in millions)					
Principal and interest payments						
on variable rate debt	\$23.4	\$22.7	\$22.0	\$508.2	\$ —	—
Average cash interest rate	4.81 %	4.66 %	4.52 %	4.52 %	—	—
Impact of 1% increase in interest rate index	\$4.9	\$4.9	\$4.9	\$4.9	\$ —	—

We also have \$3.55 billion aggregate principal amount of fixed rate senior notes. The table below summarizes our expected interest and principal payments related to our fixed rate debt at December 31, 2018.

	2019	2020	2021	2022	2023	There- after
	(dollars in millions)					
Principal and interest payments						
on fixed rate debt	\$195.7	\$195.7	\$829.5	\$163.3	\$163.3	\$3,171.4
Average cash interest rate	5.51 %	5.51 %	5.57 %	5.63 %	5.63 %	5.38 %

Foreign Currency Risk

Approximately 44% and 46% of net sales for 2018 and 2017, respectively, were to customers located outside the U.S. Significant changes in foreign currency exchange rates could adversely affect our international sales levels and the related collection of amounts due. In addition, a significant decline in the value of currencies used in certain regions of the world as compared to the U.S. dollar could adversely affect product sales in those regions because our products may become more expensive for those customers to pay for in their local currency. Conversely, significant increases in the value of foreign currencies as compared to the U.S. dollar could adversely affect profitability as certain product costs increase relative to a U.S. dollar-denominated sales price. The foreign currencies to which we have the greatest exposure include the Chinese yuan, euro, Czech koruna, Australian dollar, Indian rupee, Mexican peso and Brazilian

real. Local manufacturing provides a partial natural hedge and we continue to evaluate additional alternatives to help us reasonably manage the market risk related to foreign currency exposures.

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We use derivative instruments such as forward exchange contracts to manage the risk of fluctuations in the value of certain foreign currencies. At December 31, 2018, we had foreign exchange contracts with a net unrealized loss of \$1.3 million, with maturities of up to nine months and aggregate notional value of \$363 million (based on exchange rates as of December 31, 2018). These contracts are not designated as hedges for accounting purposes and are marked to market each period through earnings and, as such, there were no unrecognized gains or losses as of December 31, 2018 or 2017. In addition, we hold certain foreign exchange forward contracts designated as net investment hedges to mitigate a portion of the foreign currency risk on our euro net investment in a foreign subsidiary. At December 31, 2018, we held designated forward contracts with an aggregate notional value of \$40 million and a maturity of twelve months. Our derivative instruments are not leveraged and are not held for trading or speculation. See Note 7 in the Notes to Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for further discussion of these contracts. We continuously evaluate the amount and type of derivative instruments utilized to manage the market risk related to foreign currency exposures.

Commodity Price Risk

Materials account for a large portion of our cost of sales. These materials, such as copper, aluminum, steel, plastics and other polymers, bimetals and optical fiber, are subject to changes in market price as they are influenced by commodity markets and supply and demand levels, among other factors. Management attempts to mitigate these risks through effective requirements planning and by working closely with key suppliers to obtain the best possible pricing and delivery terms. We may also enter into agreements with certain suppliers to guarantee our access to certain key components. As of December 31, 2018, we had forward purchase commitments outstanding under take-or-pay contracts for certain metals of approximately \$21.7 million that we expect to consume in the normal course of operations through the second quarter of 2019. We continuously evaluate the amount and type of derivative instruments utilized to manage commodity price risk.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of CommScope Holding Company, Inc.

Opinion on the Financial Statements

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

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), 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.

Adoption of New Accounting Standards

As discussed in Note 2 to the consolidated financial statements, the Company changed its classification of net periodic benefit cost for pension and other postretirement benefit plans.

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 2008.

Charlotte, North Carolina

February 20, 2019

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of CommScope Holding Company, Inc.

Opinion on Internal Control over Financial Reporting

We have audited CommScope Holding Company, 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, CommScope Holding Company, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, and the related consolidated statements of operations and comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes, of the Company 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

Charlotte, North Carolina

February 20, 2019

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CommScope Holding Company, Inc.

Consolidated Statements of Operations and Comprehensive Income

(In thousands, except per share amounts)

	Year Ended December 31,		
	2018	2017	2016
Net sales	\$4,568,507	\$4,560,582	\$4,923,621
Operating costs and expenses:			
Cost of sales	2,880,223	2,792,779	2,894,371
Selling, general and administrative	729,032	795,381	881,661
Research and development	185,696	185,612	201,321
Amortization of purchased intangible assets	264,563	270,989	297,202
Restructuring costs, net	44,025	43,782	42,875
Asset impairments	15,000	—	38,552
Total operating costs and expenses	4,118,539	4,088,543	4,355,982
Operating income	449,968	472,039	567,639
Other expense, net	(44,256)	(9,469)	(23,060)
Interest expense	(242,017)	(257,059)	(277,534)
Interest income	7,017	4,221	5,524
Income before income taxes	170,712	209,732	272,569
Income tax expense	(30,495)	(15,968)	(49,731)
Net income	\$140,217	\$193,764	\$222,838
Earnings per share:			
Basic	\$0.73	\$1.01	\$1.16
Diluted	\$0.72	\$0.98	\$1.13
Weighted average shares outstanding:			
Basic	192,022	192,430	192,470
Diluted	195,332	196,811	196,459
Comprehensive income:			
Net income	\$140,217	\$193,764	\$222,838
Other comprehensive income (loss), net of tax:			
Foreign currency translation gain (loss)	(87,771)	201,378	(93,528)
Defined benefit plans:			
Change in unrecognized actuarial gain (loss)	23,301	6,876	(16,002)
Change in unrecognized net prior service cost (credit)	(11,676)	(2,255)	96
Gain (loss) on net investment hedge	3,544	(4,981)	—
Available-for-sale securities	—	(2,508)	(4,001)
Total other comprehensive income (loss), net of tax	(72,602)	198,510	(113,435)
Total comprehensive income	\$67,615	\$392,274	\$109,403

See notes to consolidated financial statements.

CommScope Holding Company, Inc.

Consolidated Balance Sheets

(In thousands, except share amounts)

	December 31,	
	2018	2017
Assets		
Cash and cash equivalents	\$458,195	\$453,977
Accounts receivable, less allowance for doubtful accounts of \$17,398 and \$13,976, respectively	810,359	898,829
Inventories, net	473,327	444,941
Prepaid expenses and other current assets	135,944	146,112
Total current assets	1,877,825	1,943,859
Property, plant and equipment, net of accumulated depreciation of \$437,713 and \$390,389, respectively	450,861	467,289
Goodwill	2,852,309	2,886,630
Other intangible assets, net	1,351,990	1,636,084
Other noncurrent assets	97,555	107,804
Total assets	\$6,630,540	\$7,041,666
Liabilities and Stockholders' Equity		
Accounts payable	\$399,237	\$436,737
Other accrued liabilities	291,385	286,980
Total current liabilities	690,622	723,717
Long-term debt	3,985,904	4,369,401
Deferred income taxes	83,341	134,241
Pension and other postretirement benefit liabilities	16,843	25,140
Other noncurrent liabilities	97,062	141,341
Total liabilities	4,873,772	5,393,840
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, \$0.01 par value: Authorized shares: 200,000,000; Issued and outstanding shares: None	—	—
Common stock, \$0.01 par value: Authorized shares: 1,300,000,000; Issued and outstanding shares: 192,376,255 and 190,906,110, respectively	1,991	1,972
Additional paid-in capital	2,385,082	2,334,071
Retained earnings (accumulated deficit)	(249,777)	(395,998)
Accumulated other comprehensive loss	(159,205)	(86,603)
Treasury stock, at cost: 6,744,082 shares and 6,336,144 shares, respectively	(221,323)	(205,616)
Total stockholders' equity	1,756,768	1,647,826
Total liabilities and stockholders' equity	\$6,630,540	\$7,041,666

See notes to consolidated financial statements.

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CommScope Holding Company, Inc.

Consolidated Statements of Cash Flows

(In thousands)

	Year Ended December 31,		
	2018	2017	2016
Operating Activities:			
Net income	\$140,217	\$193,764	\$222,838
Adjustments to reconcile net income to net cash generated			
by operating activities:			
Depreciation and amortization	357,458	378,012	399,053
Equity-based compensation	44,899	41,850	35,006
Deferred income taxes	(49,247)	(71,475)	(100,878)
Asset impairments	15,000	—	38,552
Changes in assets and liabilities:			
Accounts receivable	65,070	96,745	(100,867)
Inventories	(48,456)	53,658	(31,996)
Prepaid expenses and other current assets	998	(1,273)	14,273
Accounts payable and other accrued liabilities	(790)	(154,691)	191,405
Other noncurrent liabilities	(54,615)	14,644	(35,950)
Other noncurrent assets	(8,004)	(8,418)	(1,834)
Other	31,614	43,470	10,619
Net cash generated by operating activities	494,144	586,286	640,221
Investing Activities:			
Additions to property, plant and equipment	(82,347)	(68,721)	(68,314)
Proceeds from sale of property, plant and equipment	12,908	5,424	4,084
Cash paid for acquisitions, including purchase price adjustments,			
net of cash acquired	—	(105,249)	6,098
Proceeds from sale of businesses and long-term investments	—	9,898	1,292
Proceeds (payments) upon settlement of net investment			
hedge	5,134	(7,558)	—
Other	—	—	2,253
Net cash used in investing activities	(64,305)	(166,206)	(54,587)
Financing Activities:			
Long-term debt repaid	(550,000)	(990,379)	(718,914)
Long-term debt proceeds	150,000	780,379	19,764
Debt issuance and modification costs	—	(8,363)	(4,318)
Debt extinguishment costs	—	(14,800)	(17,779)
Cash paid for repurchase of common stock	—	(175,000)	—
Proceeds from the issuance of common shares under equity-based			
compensation plans	6,130	9,949	16,756

Tax withholding payments for vested equity-based compensation

awards	(15,707)	(15,405)	(3,878)
Net cash used in financing activities	(409,577)	(413,619)	(708,369)
Effect of exchange rate changes on cash and cash equivalents	(16,044)	19,288	(11,921)
Change in cash and cash equivalents	4,218	25,749	(134,656)
Cash and cash equivalents at beginning of period	453,977	428,228	562,884
Cash and cash equivalents at end of period	\$458,195	\$453,977	\$428,228

See notes to consolidated financial statements.

CommScope Holding Company, Inc.

Consolidated Statements of Stockholders' Equity

(In thousands, except share amounts)

	Year Ended December 31,		
	2018	2017	2016
Number of common shares outstanding:			
Balance at beginning of period	190,906,110	193,837,437	191,368,727
Issuance of shares under equity-based compensation plans	1,878,083	2,275,595	2,611,710
Shares surrendered under equity-based compensation plans	(407,938)	(411,932)	(143,000)
Repurchase of common stock	—	(4,794,990)	—
Balance at end of period	192,376,255	190,906,110	193,837,437
Common stock:			
Balance at beginning of period	\$1,972	\$1,950	\$1,923
Issuance of shares under equity-based compensation plans	19	22	27
Balance at end of period	\$1,991	\$1,972	\$1,950
Additional paid-in capital:			
Balance at beginning of period	\$2,334,071	\$2,282,014	\$2,216,202
Issuance of shares under equity-based compensation plans	6,111	9,927	16,729
Equity-based compensation	44,900	41,835	34,756
Cumulative effect of change in accounting principle	—	295	—
Tax benefit from shares issued under equity-based compensation plans	—	—	14,327
Balance at end of period	\$2,385,082	\$2,334,071	\$2,282,014
Retained earnings (accumulated deficit):			
Balance at beginning of period	\$(395,998)	\$(589,556)	\$(812,394)
Net income	140,217	193,764	222,838
Cumulative effect of change in accounting principles	6,004	(206)	—
Balance at end of period	\$(249,777)	\$(395,998)	\$(589,556)
Accumulated other comprehensive loss:			
Balance at beginning of period	\$(86,603)	\$(285,113)	\$(171,678)
Other comprehensive income (loss), net of tax	(72,602)	198,510	(113,435)
Balance at end of period	\$(159,205)	\$(86,603)	\$(285,113)
Treasury stock, at cost:			
Balance at beginning of period	\$(205,616)	\$(15,211)	\$(11,333)
Net shares surrendered under equity-based compensation plans	(15,707)	(15,405)	(3,878)
Repurchase of common stock	—	(175,000)	—
Balance at end of period	\$(221,323)	\$(205,616)	\$(15,211)
Total stockholders' equity	\$1,756,768	\$1,647,826	\$1,394,084

See notes to consolidated financial statements.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements

(In thousands, unless otherwise noted)

1. BACKGROUND AND DESCRIPTION OF THE BUSINESS

CommScope Holding Company, Inc., along with its direct and indirect subsidiaries (CommScope or the Company), is a global provider of infrastructure solutions for communication networks. The Company's solutions and services for wired and wireless networks enable high-bandwidth data, video and voice applications. CommScope's global leadership position is built upon innovative technology, broad solution offerings, high-quality and cost-effective customer solutions, and global manufacturing and distribution scale.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Consolidation

The accompanying consolidated financial statements include CommScope Holding Company, Inc., along with its direct and indirect subsidiaries. All intercompany accounts and transactions are eliminated in consolidation.

Prior to January 1, 2017, the Company consolidated the operating results of the Broadband Network Solutions (BNS) business acquired from TE Connectivity based on the BNS fiscal reporting calendar that resulted in a reporting lag of one day for the year ended December 31, 2016. The BNS business results included 52 weeks for the year ended December 31, 2017 compared to 53 weeks for the year ended December 31, 2016. Effective January 1, 2017, the reporting lag was eliminated as a result of system conversions that were part of the BNS integration. The elimination of the reporting lag represents a change in accounting principle which the Company believes to be preferable because it provides more current information to the users of its financial statements. The Company determined that it was impracticable to apply the effects of the lag elimination to financial reporting periods prior to January 1, 2017, and therefore, reported the cumulative effect of the change in accounting principle in net income for the year ended December 31, 2017.

Certain prior year amounts have been reclassified to conform to the current year presentation.

Use of Estimates in the Preparation of the Financial Statements

The preparation of the accompanying consolidated financial statements in conformity with accounting principles generally accepted in the United States (U.S.) requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. These estimates and their underlying assumptions form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other objective sources. The Company bases its estimates on historical experience and on assumptions that are believed to be reasonable under the circumstances and revises its estimates, as appropriate, when events or changes in circumstances indicate that revisions may be necessary. Significant accounting estimates reflected in the Company's financial statements include the allowance for doubtful accounts; reserves for sales returns, discounts, allowances, rebates and distributor price protection programs; inventory excess and obsolescence reserves; product warranty reserves and other contingent liabilities; tax valuation allowances; liabilities for unrecognized tax benefits; purchase price allocations; impairment reviews for investments, fixed assets, goodwill and other intangibles; and pension and other postretirement benefit costs and liabilities. Although these estimates are based on management's knowledge of and experience with past and current events and on management's assumptions about future events, it is at least reasonably possible that they may ultimately differ materially from actual results.

Cash and Cash Equivalents

Cash and cash equivalents represent deposits in banks and cash invested temporarily in various instruments with a maturity of three months or less at the time of purchase.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are stated at the amount owed by the customer, net of allowances for estimated doubtful accounts, discounts, returns and rebates. The Company maintains allowances for doubtful accounts for estimated losses expected to result from the inability of its customers to make required payments. These estimates are based on management's evaluation of the ability of customers to make payments, focusing on historical experience, known customer financial difficulties and the age of receivable balances. Accounts receivable are charged to the allowance when determined to be no longer collectible. The Company does not offer extended payment terms to customers and as a result amounts owed are not adjusted for the effects of any significant financing component.

Inventories

Inventories are stated at the lower of cost or net realizable value. Inventory cost is determined on a first-in, first-out (FIFO) basis. Costs such as idle facility expense, excessive scrap and re-handling costs are expensed as incurred. The Company maintains reserves to reduce the value of inventory to the lower of cost or net realizable value, including reserves for excess and obsolete inventory.

Long-Lived Assets

Property, Plant and Equipment

Property, plant and equipment are stated at cost. Upon application of acquisition accounting, property, plant and equipment are measured at estimated fair value as of the acquisition date to establish a new historical cost basis. Provisions for depreciation are based on estimated useful lives of the assets using the straight-line method. Useful lives generally range from 10 to 35 years for buildings and improvements and 3 to 10 years for machinery and equipment. Expenditures for repairs and maintenance are expensed as incurred. Assets that management intends to dispose of and that meet held for sale criteria are carried at the lower of the carrying value or fair value less costs to sell.

Goodwill and Other Intangible Assets

Goodwill is assigned to reporting units based on the difference between the purchase price as allocated to the reporting units and the estimated fair value of the identified net assets acquired as allocated to the reporting units. Purchased intangible assets with finite lives are carried at their estimated fair values at the time of acquisition less accumulated amortization and any impairment charges. Amortization is recognized on a straight-line basis over the estimated useful lives of the respective assets (see Note 4).

Asset Impairments

Goodwill is tested for impairment annually or at other times if events have occurred or circumstances exist that indicate the carrying value of the reporting unit may exceed its fair value. Property, plant and equipment and intangible assets with finite lives are reviewed for impairment whenever events or changes in circumstances indicate that the carrying value of the assets may not be recoverable, based on the undiscounted cash flows expected to be derived from the use and ultimate disposition of the assets. Assets identified as impaired are carried at estimated fair value. See Notes 4 and 8 for discussion of impairment charges. Due to uncertain market conditions, it is possible that

future impairment reviews may indicate additional impairments of goodwill, other intangible assets and/or property, plant and equipment, which could result in charges that are material to the Company's results of operations.

Income Taxes

Deferred income taxes reflect the future tax consequences of differences between the financial reporting and tax basis of assets and liabilities. The Company records a valuation allowance, when appropriate, to reduce deferred tax assets to an amount that is more likely than not to be realized.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Tax benefits that result from uncertain tax positions may be recognized only if they are considered more likely than not to be sustainable, based on their technical merits. The amount of benefit to be recognized is the largest amount of tax benefit that is at least 50% likely to be realized.

In addition, the Company does not provide for U.S. taxes related to the foreign currency remeasurement gains and losses on its long-term intercompany loans with foreign subsidiaries. These loans are not expected to be repaid in the foreseeable future, and the foreign currency gains and losses are therefore recorded to accumulated other comprehensive loss.

Revenue Recognition

The Company recognizes revenue based on the satisfaction of distinct obligations to transfer goods and services to customers. The majority of the Company's revenue is from product sales. Revenue from product sales is recognized when control is transferred to the customer, typically upon either shipment or delivery. A minor portion of the Company's revenue is derived from project contracts containing a combination of product and service obligations. Revenue from project contracts is recognized either at a point in time or over time using cost input methods, based on the specific terms of each contract.

For project contracts containing multiple distinct performance obligations, the transaction price is allocated based on the relative standalone estimated selling price of each performance obligation. The relative standalone selling price is determined using current price lists and observable pricing in separate contracts with similar customers. For performance obligations recognized over-time, judgment is required to evaluate assumptions, including the total estimated costs to determine progress towards completion of the performance obligation and to calculate the corresponding amount of revenue to recognize. If estimated total costs on any contract are greater than the net contract revenues, the entire estimated loss is recognized in the period the loss becomes known. The cumulative effects on revenue from revisions to total estimated costs are recorded in the period in which the revisions to estimates are identified and the amounts can be reasonably estimated.

The Company also recognizes revenue from other customer contract types, including licensing of intellectual property, software licensing and post-contract support (PCS) which may be sold as part of a bundled product offering or as a separate contract. For bundled product arrangements, the transaction price is allocated based on the relative standalone estimated selling price of each performance obligation. Distinct intellectual property obligations, including software, are considered functional in nature and are recognized as revenue at the point in time the customer receives the rights to use and benefit from the intellectual property or are determined using a usage-based royalty. PCS obligations are typically recognized over the term of the contract.

Revenue is measured based on the consideration to which the Company expects to be entitled, based on customer contracts. For sales to distributors, system integrators and value-added resellers (primarily for the CommScope Connectivity Solutions (CCS) segment), revenue is adjusted for variable consideration amounts, including estimated discounts, returns, rebates and distributor price protection programs. These estimates are determined based upon historical experience, contract terms, inventory levels in the distributor channel and other related factors. Adjustments to variable consideration estimates are recorded when circumstances indicate revisions may be necessary.

The Company records a contract asset for unbilled accounts receivable related to revenue that has been recognized in advance of consideration being unconditionally due from the customer, which is common for certain project contract

performance obligations. Contract asset amounts are transferred to accounts receivable when the Company's right to the consideration becomes unconditional, which varies by contract, but is generally based on achieving certain acceptance milestones. The Company recognizes the incremental costs of obtaining a contract as an expense when incurred if the amortization period of the asset would be one year or less.

A contract liability for deferred revenue is recorded when consideration is received or is unconditionally due from a customer prior to transferring control of goods or services to the customer under the terms of a contract. Deferred revenue balances typically result from advance payments received from customers for product contracts or from billings in excess of revenue recognized on project or services arrangements.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The Company includes shipping and handling costs billed to customers in net sales and includes the costs incurred to transport product to customers as cost of sales. Shipping and handling costs incurred after control is transferred to the customer are accounted for as fulfillment costs and are not accounted for as separate revenue obligations. Certain internal handling costs, which relate to activities to prepare goods for shipment, are recorded in selling, general and administrative expense and were \$55.0 million, \$62.1 million and \$56.2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Tax Collected from Customers

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

Product Warranties

The Company recognizes a liability for the estimated claims that may be paid under its customer assurance-type warranty agreements to remedy potential deficiencies of quality or performance of the Company's products. These product warranties extend over periods ranging from one to twenty-five years from the date of sale, depending upon the product subject to the warranty. The Company records a provision for estimated future warranty claims as cost of sales based upon the historical relationship of warranty claims to sales and specifically identified warranty issues. The Company bases its estimates on assumptions that are believed to be reasonable under the circumstances and revises its estimates, as appropriate, when events or changes in circumstances indicate that revisions may be necessary. Such revisions may be material.

Advertising Costs

Advertising costs are expensed in the period in which they are incurred. Advertising expense was \$17.3 million, \$21.2 million and \$20.0 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Research and Development

Research and development (R&D) costs are expensed in the period in which they are incurred. R&D costs include materials and equipment that have no alternative future use, depreciation on equipment and facilities currently used for R&D purposes, personnel costs, contract services and reasonable allocations of indirect costs, if clearly related to an R&D activity. Expenditures in the pre-production phase of an R&D project are recorded as R&D expense. However, costs incurred in the pre-production phase that are associated with output actually used in production are recorded in cost of sales. A project is considered finished with pre-production efforts when management determines that it has achieved acceptable levels of scrap and yield, which vary by project. Expenditures related to ongoing production are recorded in cost of sales.

Derivative Instruments and Hedging Activities

CommScope is exposed to risks resulting from adverse fluctuations in commodity prices, interest rates and foreign currency exchange rates. CommScope's risk management strategy includes the use of derivative financial instruments whenever management determines their use to be reasonable and practical. This strategy does not permit the use of derivative financial instruments for trading or speculation. Derivative contracts not designated as hedging instruments

are measured at fair value and are marked to market each period through earnings.

During 2017, the Company began a hedging strategy to designate certain foreign exchange forward contracts as net investment hedges to mitigate a portion of the foreign currency risk on the euro net investment in a foreign subsidiary. Hedge effectiveness is assessed each quarter based on the net investment in the foreign subsidiary designated as the hedged item and the overall changes in the fair value of the designated forward contracts. For hedges that meet the effectiveness requirements, changes in fair value are recorded as a component of other comprehensive income (loss), net of tax. The Company did not designate any transactions as hedges in the year ended December 31, 2016.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

In the first quarter of 2018, the Company changed the method used to assess the effectiveness of its net investment hedges from the forward rate method to the spot rate method. The Company believes the spot rate method better aligns with the underlying foreign currency exposure of the hedged net investment. Effective January 1, 2018, the spot-forward differences of the designated forward contracts are excluded from hedge effectiveness at inception and are recognized on a straight-line basis to interest expense over the life of each contract. See Note 7 for further disclosure related to the derivative instruments and hedging activities.

The Company has elected and documented the use of the normal purchases and sales exception for normal purchase and sales contracts that meet the definition of a derivative financial instrument.

Foreign Currency Translation

For the years ended December 31, 2018, 2017 and 2016, approximately 44%, 46% and 46%, respectively, of the Company's net sales were to customers located outside the U.S. A portion of these sales were denominated in currencies other than the U.S. dollar, particularly sales from the Company's foreign subsidiaries. The financial position and results of operations of certain of the Company's foreign subsidiaries are measured using the local currency as the functional currency. Revenues and expenses of these subsidiaries have been translated into U.S. dollars at average exchange rates prevailing during the period. Assets and liabilities of these subsidiaries have been translated at the exchange rates as of the balance sheet date. Translation gains and losses are recorded in accumulated other comprehensive loss. Upon sale or liquidation of an investment in a foreign subsidiary, the amount of net translation gains or losses that have been accumulated in other comprehensive loss attributable to that investment are reported as a gain or loss in earnings in the period in which the sale or liquidation occurs. During the year ended December 31, 2018, the Company liquidated a foreign subsidiary and recognized \$14.0 million in translation losses in other expense, net that had been in accumulated other comprehensive loss.

Aggregate foreign currency gains and losses, such as those resulting from the settlement of receivables or payables, foreign currency contracts and short-term intercompany advances in a currency other than the subsidiary's functional currency, are recorded currently in earnings (included in other expense, net) and resulted in losses of \$15.9 million, \$8.7 million and \$9.5 million during the years ended December 31, 2018, 2017 and 2016, respectively. Foreign currency remeasurement gains and losses related to certain long-term intercompany loans that are not expected to be settled in the foreseeable future and the effective portion of foreign currency contracts designated as net investment hedges are recorded in accumulated other comprehensive loss. See Note 7 for disclosure of foreign currency gains and losses specifically related to foreign currency contracts.

Equity-Based Compensation

The estimated fair value of stock awards is recognized as expense over the requisite service periods. Forfeitures of stock awards are recognized as they occur. The Company records deferred tax assets related to compensation expense for awards that are expected to result in future tax deductions for the Company, based on the amount of compensation cost recognized and the Company's statutory tax rate in the jurisdiction in which it expects to receive a deduction. Differences between the deferred tax assets recognized for financial reporting purposes and actual tax deductions reported on the Company's income tax return are recorded in the Consolidated Statements of Operations and Comprehensive Income within income tax expense.

Earnings Per Share

Basic earnings per share is computed by dividing net income by the weighted average number of common shares outstanding during the period. Diluted earnings per share is based on net income divided by the weighted average number of common shares outstanding plus the dilutive effect of potential common shares outstanding during the period using the treasury stock method. Dilutive potential common shares include outstanding equity-based awards (stock options, restricted stock units and performance share units). Certain outstanding equity-based awards were not included in the computation of diluted earnings per share because the effect was either antidilutive or the performance condition was not met (2.1 million, 1.5 million and 1.0 million shares for the years ended December 31, 2018, 2017 and 2016, respectively).

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table presents the basis for the earnings per share computations:

	Year Ended December 31,		
	2018	2017	2016
Numerator:			
Net income for basic and diluted earnings			
per share	\$140,217	\$193,764	\$222,838
Denominator:			
Weighted average common shares outstanding - basic	192,022	192,430	192,470
Dilutive effect of equity-based awards	3,310	4,381	3,989
Weighted average common shares outstanding - diluted	195,332	196,811	196,459
Earnings per share:			
Basic	\$0.73	\$1.01	\$1.16
Diluted	\$0.72	\$0.98	\$1.13

Business Combinations

The Company uses the acquisition method of accounting for business combinations which requires the allocation of the acquisition date fair value to the underlying tangible and intangible assets acquired and liabilities assumed based on their respective fair market value. Goodwill represents the excess of the consideration transferred over the fair value of the net assets acquired. The fair values of the assets acquired and liabilities assumed are determined based upon the Company's valuation and involves making significant estimates and assumptions based on facts and circumstances that existed as of the acquisition date. The Company uses a measurement period following the acquisition date to gather information that existed as of the acquisition date that is needed to determine the fair value of the assets acquired and liabilities assumed. The measurement period ends once all information is obtained, but no later than one year from the acquisition date.

Concentrations of Risk

Non-derivative financial instruments used by the Company in the normal course of business include letters of credit and commitments to extend credit, primarily accounts receivable. The Company generally does not require collateral on its accounts receivable. These financial instruments involve risk, including the credit risk of nonperformance by the counterparties to those instruments, and the actual loss may exceed the reserves provided in the Company's balance sheet. See Note 14 for further discussion of customer-related concentrations of risk.

The Company manages its exposures to credit risk associated with accounts receivable using such tools as credit approvals, credit limits and monitoring procedures. CommScope estimates the allowance for doubtful accounts based on the actual payment history and individual circumstances of significant customers as well as the age of receivables. In management's opinion, as of December 31, 2018, the Company did not have significant unreserved risk of credit

loss due to the non-performance of customers or other counterparties related to amounts receivable. However, an adverse change in financial condition of a significant customer or group of customers or in the telecommunications industry could materially affect the Company's estimates related to doubtful accounts.

The principal raw materials purchased by CommScope (aluminum, bimetals, copper, optical fiber, plastics and other polymers and steel) are subject to changes in market price as these materials are linked to various commodity markets. The Company attempts to mitigate these risks through effective requirements planning and by working closely with its key suppliers to obtain the best possible pricing and delivery terms.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Recent Accounting Pronouncements

Adopted in 2018

In the fourth quarter of 2018, the Company early adopted ASU No. 2018-14, Disclosure Framework: Changes to the Disclosure Requirements for Defined Benefit Plans, which adds disclosure requirements identified as relevant for employers that sponsor defined benefit pension or other postretirement plans, removes disclosures that are no longer considered cost beneficial, and clarifies existing guidance for certain disclosure requirements. The impact on the Company's disclosures was to remove the disclosure of the amounts in accumulated other comprehensive loss expected to be recognized as net periodic benefit cost in the next year and to provide explanations of significant gains and losses related to the changes in the benefit obligation for the period. The impacts were applied retrospectively to the disclosures for all periods presented. The adoption of this ASU only affected the disclosures on the Company's defined benefit pension plans and did not affect the Company's consolidated financial statements. See Note 10 for further discussion of the Company's defined benefit pension plans.

In the fourth quarter of 2018, the Company early adopted ASU No. 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income, which allows companies to elect reclassification from accumulated other comprehensive income to retained earnings for certain tax effects resulting from the U.S. tax legislation enacted in 2017. The Company's policy is to generally recognize the tax effects in accumulated other comprehensive income at the currently enacted tax rate and reclassify it to net income in the same period that the related pre-tax accumulated comprehensive income reclassifications are recognized. The Company did not elect the permitted reclassification and therefore adoption did not have an impact on the consolidated financial statements.

The Company adopted ASU No. 2014-09, Revenue from Contracts with Customers, including all subsequently issued clarifying guidance, on January 1, 2018. The core principle of the new guidance is to recognize revenue when promised goods or services are transferred to customers in an amount that reflects the consideration that is expected to be received for those goods or services. The Company adopted the standard using the modified retrospective approach with the cumulative effect of applying the standard on the date of adoption recognized in retained earnings (accumulated deficit).

Revenue recognition for the Company's product sales remained generally consistent with historical practice. However, the adoption of ASU No. 2014-09 resulted in acceleration of revenue recognition for certain project contracts containing integrated product and service obligations, primarily within the CommScope Mobility Solutions (CMS) segment. These multi-element contracts represented less than 2.0% of total net sales for the years ended December 31, 2018 and 2017. For these contracts, certain performance obligations are recognized over time using cost-based input methods, which recognize revenue and cost of sales based on the relationship between actual costs incurred compared to the total estimated cost for the performance obligation. Based on contracts in effect at January 1, 2018, the Company recorded a cumulative effect adjustment, net of tax, of \$3.4 million, which reduced the accumulated deficit on the Consolidated Balance Sheets. This adjustment reflects an acceleration of \$8.0 million of net sales.

The impact of adoption of the new revenue recognition standard on the consolidated financial statements was as follows:

Year Ended December 31, 2018

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	As Reported	Amounts Without Adoption of ASU No. 2014-09	Effect of Change Increase / (Decrease)
Net sales	\$4,568,507	\$4,572,634	\$ (4,127)
Cost of sales	2,880,223	2,881,920	(1,697)
Operating income	449,968	452,398	(2,430)
Income tax expense	30,495	31,117	(622)
Net income	140,217	142,025	(1,808)

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

	As of December 31, 2018		
	As	Amounts Without Adoption of	Effect of Change
	Reported	ASU No. 2014-09	Increase / (Decrease)
Assets:			
Accounts receivable, less allowance	\$810,359	\$808,381	\$ 1,978
for doubtful accounts			
Inventories, net	473,327	475,008	(1,681)
Liabilities:			
Other accrued liabilities	291,385	292,693	(1,308)
Stockholders' equity:			
Retained earnings (accumulated deficit)	(249,777)	(251,382)	1,605

The Company adopted ASU No. 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities, on January 1, 2018. This new guidance modifies how entities measure equity investments (except those accounted for under the equity method of accounting) and present changes in the fair value of financial liabilities; simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify impairment; changes presentation and disclosure requirements; and clarifies that an entity should evaluate the need for a valuation allowance on a deferred tax asset related to available-for-sale securities in combination with the entity's other deferred tax assets. Adoption of this new guidance did not have a material impact on the consolidated financial statements.

The Company adopted ASU No. 2016-16, Accounting for Income Taxes, Intra-Entity Asset Transfers of Assets Other than Inventory, on January 1, 2018. Under previous guidance, the tax effects of intra-entity asset transfers were deferred until the transferred asset was sold to a third party or otherwise recovered through use. The new guidance eliminates the exception for all intra-entity sales of assets other than inventory. As a result, the tax effect of an intra-entity asset sale would be recognized when the transfer occurs. The Company recorded a cumulative effect adjustment of \$2.6 million as of January 1, 2018 that decreased the accumulated deficit on the Consolidated Balance Sheets as a result of this new guidance.

The Company adopted ASU No. 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, on January 1, 2018. The new standard requires an employer to report the service cost component of net periodic benefit cost in the same line item as other compensation costs arising from services rendered by the employee and requires the other components of net periodic benefit cost to be reported outside the subtotal of operating income. Of the total \$19.8 million of net periodic benefit cost for year ended December 31, 2018, \$15.7 million of net periodic benefit cost was recorded in other expense, net, and \$4.1 million of net periodic benefit cost was recorded within operating income. The Company utilized the practical expedient and used the amounts disclosed in its employee benefit plans note for the years ended December 31, 2017 and 2016 as the basis for applying the retrospective presentation requirements. The Company reclassified \$5.6 million and \$7.1 million of net periodic benefit income from operating income to other expense, net for the years ended December 31, 2017 and 2016, respectively. The adoption of this guidance had no impact on the previously reported income before income taxes or

net income for the years ended December 31, 2017 and 2016.

The Company adopted ASU No. 2017-12, Targeted Improvements to Accounting for Hedging Activities, on January 1, 2018. The new guidance provides targeted improvements to the hedge accounting model intended to allow financial reporting to more closely reflect an entity's risk management activities and to simplify the application of hedge accounting. Beginning January 1, 2018, the Company has elected to assess the effectiveness of its net investment hedges using the spot rate method. As a result, differences between the spot rate and the forward rate will be amortized to earnings on a straight-line basis to interest expense over the life of the contract. See Note 7 for details on the Company's derivative and hedging activities and related impacts on the financial statements.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Issued but Not Adopted

In August 2018, the Financial Accounting Standards Board (FASB) issued ASU No. 2018-15, Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement (CCA) that is a Service Contract, which aligns the accounting for costs incurred to implement a CCA that is a service arrangement with the guidance on capitalizing costs associated with developing or obtaining internal-use software. ASU No. 2018-15 is effective for the Company as of January 1, 2020 and early adoption is permitted. The Company is evaluating the impact of the new guidance on the consolidated financial statements and when it will be adopted.

In January 2017, the FASB issued ASU No. 2017-04, Simplifying the Test of Goodwill Impairment, which eliminates Step 2 from the goodwill impairment test. Under the new guidance, an entity will perform its annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An entity will recognize a goodwill impairment charge for the excess of the reporting unit's carrying amount over its fair value, up to the amount of goodwill allocated to that reporting unit. ASU No. 2017-04 is effective for the Company as of January 1, 2020 and early adoption is permitted. The Company plans to adopt this new guidance as of January 1, 2019 and does not anticipate that adoption will materially affect the consolidated financial statements.

In June 2016, the FASB issued ASU No. 2016-13, Measurement of Credit Losses on Financial Instruments. The new guidance replaces the current incurred loss method used for determining credit losses on financial assets, including trade receivables, with an expected credit loss method. ASU No. 2016-13 is effective for the Company as of January 1, 2020 and early adoption is permitted. The Company is evaluating the impact of the new guidance on the consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which supersedes the current leasing guidance in Topic 840, Leases. Under the new guidance, lessees are required to recognize assets and lease liabilities for the rights and obligations created by leased assets previously classified as operating leases. The Company is required to adopt the new standard, including subsequently issued clarifying guidance, as of January 1, 2019. In July 2018, the FASB issued ASU No. 2018-11, which allows entities a transition election to recognize the effects of applying the new leasing standard as a cumulative-effect adjustment to retained earnings (accumulated deficit) as opposed to restating comparative periods for the effects of applying the new standard. The Company plans to elect this transition approach. The Company is finalizing the necessary changes to its accounting policies, processes, internal controls and information systems that will be required to meet the new standard's reporting and disclosure requirements. The majority of the Company's leased asset value relates to real estate with the remainder primarily related to vehicles and equipment. The Company estimates that adoption of the new standard will increase total assets and total liabilities in the Consolidated Balance Sheets by \$95 million to \$100 million due to the addition of right-of-use assets and lease obligations for operating type leases, net of the elimination of existing prepaid rent, deferred rent and lease termination cost amounts. The Company does not expect the adoption of the new standard to significantly affect the Consolidated Statements of Operations and Comprehensive Income or the Consolidated Statements of Cash Flows.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

3. ACQUISITIONS

Cable Exchange

On August 1, 2017, the Company acquired Cable Exchange in an all-cash transaction. The Company paid \$108.7 million (\$105.2 million net of cash acquired) and recorded a \$14.5 million liability for the remaining payments due in 2019 and 2020. Cable Exchange is a quick-turn supplier of fiber optic and copper assemblies for data, voice and video communications. Net sales of Cable Exchange products are included in the CCS segment for the years ended December 31, 2018 and 2017 and were not material.

The allocation of the purchase price, based on estimates of the fair values of the assets acquired and liabilities assumed, is as follows (in millions):

	Estimated Fair Value
Cash and cash equivalents	\$ 3.5
Accounts receivable	6.4
Inventory	4.4
Property, plant and equipment	0.9
Goodwill	49.6
Identifiable intangible assets	61.1
Less: Liabilities assumed	(2.7)
Net acquisition cost	\$ 123.2

The goodwill arising from the purchase price allocation of the Cable Exchange acquisition is believed to result from the Company's reputation in the marketplace and assembled workforce and is expected to be deductible for income tax purposes.

4. GOODWILL AND OTHER INTANGIBLE ASSETS

The following table presents details of the Company's intangible assets other than goodwill as of December 31, 2018 and 2017 (in millions):

	2018			2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Customer base	\$1,911.2	\$ 1,103.5	\$ 807.7	\$1,930.3	\$ 935.2	\$ 995.1
Trade names and trademarks	608.4	249.3	359.1	609.7	215.3	394.4
Patents and technologies	582.9	397.7	185.2	592.0	345.4	246.6
Non-compete agreements	0.3	0.3	—	0.3	0.3	—

Total intangible assets	\$3,102.8	\$ 1,750.8	\$ 1,352.0	\$3,132.3	\$ 1,496.2	\$ 1,636.1
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There were no intangible asset impairments identified during the years ended December 31, 2018 and 2017. During the year ended December 31, 2016, the Company determined that certain patent and technology intangible assets in the CCS segment were no longer recoverable and recorded pretax charges of \$15.0 million in asset impairments on the Consolidated Statements of Operations and Comprehensive Income.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The Company's finite-lived intangible assets are being amortized on a straight-line basis over the weighted-average amortization periods in the following table. The aggregate weighted-average amortization period is 11.8 years.

	Weighted- Average Amortization Period (in years)
Customer base	11.0
Trade names and trademarks	18.8
Patents and technologies	6.8

Amortization expense for intangible assets was \$264.6 million, \$271.0 million and \$297.2 million for the years ended December 31, 2018, 2017 and 2016, respectively. Estimated amortization expense for the next five years is as follows (in millions):

	Estimated Amortization Expense
2019	\$ 233.6
2020	227.3
2021	207.5
2022	141.1
2023	101.7

The following table presents goodwill by reportable segments (in millions):

	CCS	CMS	Total
Goodwill, gross, as of December 31, 2015	\$1,986.6	\$899.7	2,886.3
Adjustments to purchase price allocations	107.7	4.4	112.1
Foreign exchange	(16.8)	(2.3)	(19.1)
Goodwill, gross, as of December 31, 2016	2,077.5	901.8	2,979.3

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Acquisitions	49.6	—	49.6
Foreign exchange	66.1	2.6	68.7
Goodwill, gross, as of December 31, 2017	2,193.2	904.4	3,097.6
Foreign exchange	(31.6)	(2.7)	(34.3)
Goodwill, gross, as of December 31, 2018	\$2,161.6	\$901.7	\$3,063.3
Accumulated impairment charges as of December 31, 2015	\$(36.2)	\$(159.5)	\$(195.7)
Impairment charges for year ended December 31, 2016	(15.3)	—	(15.3)
Accumulated impairment charges as of December 31, 2016, 2017 and 2018	(51.5)	(159.5)	(211.0)
Goodwill, net, as of December 31, 2018	\$2,110.1	\$742.2	\$2,852.3

There were no goodwill impairments identified during the years ended December 31, 2018 and 2017. The goodwill impairment charge of \$15.3 million recorded in the CCS segment during the year ended December 31, 2016 was the result of the change in reportable segments.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

5. SUPPLEMENTAL FINANCIAL STATEMENT INFORMATION

Disaggregated Net Sales

The following table presents net sales by reportable segment, disaggregated based on contract type (in millions):

	Year Ended		
	December 31, 2018		
	CCS	CMS	Total
Contract type:			
Product contracts	\$2,803.5	\$1,662.3	\$4,465.8
Project contracts	0.8	49.5	50.3
Other contracts	8.4	44.0	52.4
Consolidated net sales	\$2,812.7	\$1,755.8	\$4,568.5

Further information on net sales by reportable segment and geographic region is included in Note 14.

Allowance for Doubtful Accounts

	Year ended December 31,		
	2018	2017	2016
Allowance for doubtful accounts, beginning of period	\$13,976	\$17,211	\$19,392
Charged to costs and expenses (1)	5,963	1,277	(5,986)
Account write-offs and other	(2,541)	(4,512)	3,805
Allowance for doubtful accounts, end of period	\$17,398	\$13,976	\$17,211

(1)Net of recoveries of previously written off customer accounts.

Customer Contract Balances

The following table provides the balance sheet location and amounts of contract assets and liabilities from contracts with customers as of December 31, 2018 and 2017.

	Balance Sheet Location	December 31,	December 31,
		2018	2017
Unbilled accounts receivable	Accounts receivable, less allowance for doubtful accounts	\$ 3,082	\$ —
Deferred revenue	Other accrued liabilities	7,554	12,611

There were no material changes to contract asset balances for the year ended December 31, 2018 as a result of changes in estimates or impairments. The full amount of the deferred revenue balance as of December 31, 2018 was

classified as a current liability as the Company expects to recognize these amounts over the next twelve months.

Inventories

	December 31,	
	2018	2017
Raw materials	\$ 146,846	\$ 126,558
Work in process	98,830	98,526
Finished goods	227,651	219,857
	\$473,327	\$444,941

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Property, Plant and Equipment

	December 31,	
	2018	2017
Land and land improvements	\$49,343	\$54,002
Buildings and improvements	212,245	217,396
Machinery and equipment	597,023	556,809
Construction in progress	29,963	29,471
	888,574	857,678
Accumulated depreciation	(437,713)	(390,389)
	\$450,861	\$467,289

Depreciation expense was \$75.6 million, \$81.7 million and \$80.5 million during the years ended December 31, 2018, 2017 and 2016, respectively. No interest was capitalized during the years ended December 31, 2018, 2017 or 2016.

Other Accrued Liabilities

	December 31,	
	2018	2017
Compensation and employee benefit liabilities	\$94,313	\$97,522
Accrued interest	18,469	23,485
Deferred revenue	7,554	12,611
Product warranty accrual	15,630	16,928
Restructuring reserve	29,876	24,961
Income taxes payable	7,683	16,949
Purchase price payable	12,171	2,098
Value-added taxes payable	12,435	11,838
Accrued professional fees	19,331	10,224
Other	73,923	70,364
	\$291,385	\$286,980

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Accumulated Other Comprehensive Loss

The following table presents changes in accumulated other comprehensive income (AOCI), net of tax, and accumulated other comprehensive loss (AOCL), net of tax:

	Year Ended December 31,	
	2018	2017
Foreign currency translation		
Balance at beginning of period	\$(52,770)	\$(254,148)
Other comprehensive income (loss)	(102,501)	201,133
Amounts reclassified from AOCL	14,730	245
Balance at end of period	\$(140,541)	\$(52,770)
Net investment hedge		
Balance at beginning of period	\$(4,981)	\$—
Other comprehensive income (loss)	3,544	(4,981)
Balance at end of period	\$(1,437)	\$(4,981)
Defined benefit plan activity		
Balance at beginning of period	\$(28,852)	\$(33,473)
Other comprehensive income (loss)	(1,609)	6,047
Amounts reclassified from AOCL	13,234	(1,426)
Balance at end of period	\$(17,227)	\$(28,852)
Available-for-sale securities		
Balance at beginning of period	\$—	\$2,508
Other comprehensive income	—	3,159
Amounts reclassified from AOCI	—	(5,667)
Balance at end of period	\$—	\$—
Net AOCL at end of period	\$(159,205)	\$(86,603)

Amounts reclassified from net AOCL are recorded in other expense, net in the Consolidated Statements of Operations and Comprehensive Income.

Cash Flow Information

	Year Ended December 31,		
	2018	2017	2016
Cash paid during the period for:			
Income taxes, net of refunds	\$112,127	\$100,929	\$148,984
Interest	231,283	216,739	260,773

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

6. FINANCING

	December 31,	
	2018	2017
5.00% senior notes due March 2027	\$750,000	\$750,000
6.00% senior notes due June 2025	1,500,000	1,500,000
5.50% senior notes due June 2024	650,000	650,000
5.00% senior notes due June 2021	650,000	650,000
Senior secured term loan due December 2022	486,250	886,250
Senior secured revolving credit facility expires May 2020	—	—
Total face value of debt	\$4,036,250	\$4,436,250
Less: Original issue discount, net of amortization	(1,526)	(3,389)
Less: Debt issuance costs, net of amortization	(48,820)	(63,460)
Less: Current portion	—	—
Total long-term debt	\$3,985,904	\$4,369,401

5.00% Senior Notes Due 2027

In March 2017, CommScope Technologies LLC (CommScope Technologies), a wholly owned subsidiary of the Company, issued \$750.0 million of 5.00% senior notes due March 15, 2027 (the 2027 Notes). Interest is payable on the 2027 Notes semi-annually in arrears on March 15 and September 15 of each year.

CommScope, Inc., a wholly owned subsidiary of the Company, and each of CommScope, Inc.'s existing and future domestic subsidiaries (other than CommScope Technologies) that guarantees the senior secured credit facilities also guarantees the 2027 Notes on a senior unsecured basis, subject to certain exceptions. The 2027 Notes rank senior in right of payment with all of CommScope Technologies' and the guarantors' future subordinated indebtedness and equally in right of payment with all of CommScope Technologies' and the guarantors' existing and future senior indebtedness, including the senior secured credit facilities, the 6.00% senior notes due June 15, 2025 (the 2025 Notes), the 5.50% senior notes due June 15, 2024 (the 2024 Notes) and the 5.00% senior notes due June 15, 2021 (the 2021 Notes). The 2027 Notes and guarantees are effectively junior to all of CommScope Technologies' and the guarantors' existing and future secured indebtedness, including the senior secured credit facilities, to the extent of the value of the assets securing such secured indebtedness. In addition, the 2027 Notes are structurally subordinated to all existing and future liabilities (including trade payables) of CommScope, Inc.'s subsidiaries that do not guarantee the 2027 Notes, including indebtedness incurred by certain of CommScope, Inc.'s non-U.S. subsidiaries under the revolving credit facility.

The 2027 Notes may be redeemed prior to maturity under certain circumstances. Upon certain change of control events, the 2027 Notes may be redeemed at the option of the holders at 101% of their principal amount, plus accrued and unpaid interest. The 2027 Notes may be redeemed on or after March 15, 2022 at the redemption prices specified in the indenture governing the 2027 Notes. Prior to March 15, 2022, the 2027 Notes may be redeemed at a redemption price equal to 100% of the aggregate principal amount of the 2027 Notes to be redeemed, plus a make-whole premium (as specified in the indenture governing the 2027 Notes), plus accrued and unpaid interest. At any time prior to March 15, 2020, CommScope Technologies may also redeem up to 40% of the aggregate principal amount of the 2027 Notes at a redemption price of 105%, plus accrued and unpaid interest, using the proceeds of certain equity offerings.

In connection with issuing the 2027 Notes, the Company paid \$7.2 million of debt issuance costs during the year ended December 31, 2017, which was recorded as a reduction of the carrying amount of the debt and is being amortized over the term of the notes.

6.00% Senior Notes Due 2025

In June 2015, CommScope Technologies issued \$1.5 billion of the 2025 Notes. Interest is payable on the 2025 Notes semi-annually in arrears on June 15 and December 15 of each year.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The 2025 Notes are guaranteed on a senior unsecured basis by CommScope, Inc. and each of CommScope, Inc.'s existing and future domestic subsidiaries (other than CommScope Technologies) that guarantees the senior secured credit facilities, subject to certain exceptions, and rank as described above for the 2027 notes.

The 2025 Notes may be redeemed prior to maturity under certain circumstances. Upon certain change of control events, the 2025 Notes may be redeemed at the option of the holders at 101% of their principal amount, plus accrued and unpaid interest. The 2025 Notes may be redeemed on or after June 15, 2020 at the redemption prices specified in the indenture governing the 2025 Notes. Prior to June 15, 2020, the 2025 Notes may be redeemed at a redemption price equal to 100% of the aggregate principal amount to be redeemed, plus a make-whole premium (as specified in the indenture governing the 2025 Notes), plus accrued and unpaid interest.

5.00% Senior Notes Due 2021 and 5.50% Senior Notes Due 2024

In May 2014, CommScope, Inc., a wholly owned subsidiary of the Company, issued \$650.0 million of the 2021 Notes and \$650.0 million of the 2024 Notes. Interest is payable on the 2021 Notes and the 2024 Notes semi-annually in arrears on June 15 and December 15 of each year.

The 2021 Notes and the 2024 Notes are guaranteed on a senior unsecured basis by each of CommScope, Inc.'s existing and future domestic subsidiaries that guarantees the senior secure credit facilities, subject to certain exceptions, and rank as described above for the 2027 Notes.

The 2021 Notes and the 2024 Notes may be redeemed prior to maturity under certain circumstances. Upon certain change of control events, the 2021 Notes and the 2024 Notes may be redeemed at the option of the holders at 101% of their principal amount, plus accrued and unpaid interest to the date of purchase. The 2021 Notes and the 2024 Notes may be redeemed on or after June 15, 2017 or June 15, 2019, respectively, at the redemption prices specified in the respective indentures governing the 2021 Notes and the 2024 Notes. Prior to June 15, 2019, the 2024 Notes may be redeemed at a redemption price equal to 100% of the aggregate principal amount, plus a make-whole premium (as specified in the indentures governing the 2024 Notes), plus accrued and unpaid interest to the redemption date.

Senior Secured Credit Facilities

The Company's asset-based revolving credit facility provides borrowing capacity of up to \$550.0 million, subject to certain limitations. The asset-based revolving credit facility expires in May 2020, subject to acceleration under certain circumstances. As of December 31, 2018, the Company had no outstanding borrowings under its asset-based revolving credit facility and had availability of \$463.1 million after giving effect to borrowing base limitations and outstanding letters of credit.

As of December 31, 2018, the Company had one term loan outstanding under its senior secured credit facilities, the senior secured term loan due 2022 (the 2022 Term Loan). In July 2018, the Company repaid \$400.0 million of the 2022 Term Loan. The payment was made using \$250.0 million of cash on hand and \$150.0 million borrowed under the Company's asset-based revolving credit facility. In connection with this voluntary repayment, \$7.4 million of original issue discount and debt issuance costs were written off and included in interest expense. The Company subsequently repaid the \$150.0 million borrowed under the asset-based revolving credit facility in September 2018.

In May 2017, the Company amended the 2022 Term Loan to reduce the interest rate margin. The interest rate is, at the Company's option, either (1) the base rate (as described in the credit agreement, as amended) plus a margin of 1.00% or (2) one-, two-, three- or six-month LIBOR or, if available from all lenders, twelve-month LIBOR (selected at the Company's option) plus a margin of 2.00%. Before the amendment, the margin on the interest rate with respect to base rate loans was 1.50% and with respect to LIBOR loans was 2.50%. The amendment also reduced the 1.75% base rate floor to 1.00% and eliminated the 0.75% LIBOR floor. The amendment resulted in the repayment of \$30.4 million to certain lenders under the senior secured credit facilities and the receipt of \$30.4 million in proceeds from new lenders and existing lenders who increased their positions. In conjunction with the amendment, the Company recorded \$1.1 million of debt modification costs in other expense, net.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

During the year ended December 31, 2017, the Company repaid \$348.1 million of the 2022 Term Loan and \$111.9 million of the senior secured term loan due 2018. In connection with these repayments, \$8.3 million of original issue discount and debt issuance costs were written off and included in interest expense.

During the year ended December 31, 2016, the Company amended the 2022 Term Loan to reduce the margin on the interest rate and recorded an additional \$3.1 million of original issue discount related to this amendment.

During the year ended December 31, 2016, the Company voluntarily repaid \$150.0 million, of its senior secured term loans. In connection with the repayment, combined original issue discount and debt issuance costs of \$1.0 million were written off and included in interest expense during the year ended December 31, 2016.

The 2022 Term Loan is secured by a first priority lien on certain of the Company's non-current assets in the U.S. and a second priority lien on current assets in the U.S. The asset-based revolving credit facility is secured by a first priority lien on certain of the Company's current assets in the U.S. and several European countries and a second priority lien on the Company's non-current assets in the U.S.

No portion of the 2022 Term Loan was reflected as a current portion of long-term debt as of December 31, 2018 related to the potentially required excess cash flow payment because no such payment is expected to be required. There was no excess cash flow payment required in 2018 related to 2017.

Other Matters

The following table summarizes scheduled maturities of long-term debt as of December 31, 2018 (in millions):

	2019	2020	2021	2022	2023	Thereafter
Scheduled maturities of long-term debt	\$ —	\$ —	\$650.0	\$486.3	\$ —	\$2,900.0

The Company's non-guarantor subsidiaries held \$2,354 million, or 36%, of total assets and \$454 million, or 9%, of total liabilities as of December 31, 2018 and accounted for \$1,835 million, or 40%, of net sales for the year ended December 31, 2018. As of December 31, 2017, the non-guarantor subsidiaries held \$2,587 million, or 37%, of total assets and \$569 million, or 11%, of total liabilities. For the year ended December 31, 2017, the non-guarantor subsidiaries accounted for \$1,915 million, or 42%, of net sales. All amounts presented exclude intercompany balances.

The Company is dependent upon the earnings and cash flow of its subsidiaries to make certain payments, including debt and interest payments. Certain subsidiaries may have limitations or restrictions on transferring funds to other subsidiaries that may be necessary to meet those requirements.

The weighted average effective interest rate on outstanding borrowings, including the amortization of debt issuance costs and original issue discount, was 5.73% at December 31, 2018 and 5.45% at December 31, 2017.

7. DERIVATIVES AND HEDGING ACTIVITIES

Derivatives Not Designated As Hedging Instruments

The Company uses forward contracts to hedge a portion of its balance sheet foreign exchange re-measurement risk and to hedge certain planned foreign currency expenditures. As of December 31, 2018, the Company had foreign exchange contracts outstanding with maturities of up to nine months and aggregate notional values of \$363 million (based on exchange rates as of December 31, 2018). Unrealized gains and losses resulting from these contracts are recognized in other expense, net and partially offset corresponding foreign exchange gains and losses on the balances and expenditures being hedged. These instruments are not held for speculative or trading purposes and are not designated as hedges for hedge accounting and are marked to market each period through earnings.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table presents the balance sheet location and fair value of the Company's derivatives not designated as hedging instruments:

	Balance Sheet Location	Fair Value of Asset (Liability) December 31,	
		2018	2017
Foreign currency contracts	Prepaid expenses and other current assets	\$1,703	\$9,050
Foreign currency contracts	Other accrued liabilities	(3,044)	(574)
Total derivatives not designated as hedging instruments		\$(1,341)	\$8,476

The pretax impact of the foreign currency forward contracts, both matured and outstanding, on the Consolidated Statements of Operations and Comprehensive Income is as follows:

Foreign Currency Forward Contracts	Location of Gain (Loss)	Gain (Loss) Recognized
Year ended December 31, 2018	Other expense, net	\$ (17,833)
Year ended December 31, 2017	Other expense, net	\$ 28,633
Year ended December 31, 2016	Other expense, net	\$ (21,470)

Derivative Instruments Designated As Net Investment Hedge

During 2017, the Company began a hedging strategy to designate certain foreign exchange contracts as net investment hedges to mitigate a portion of the foreign currency risk on the euro net investment in a foreign subsidiary. As of December 31, 2018, the Company held designated forward contracts with an outstanding maturity of up to twelve months and an aggregate notional value of \$40 million. The amortization of the spot-forward differences recorded to earnings was not material for the year ended December 31, 2018.

Hedge effectiveness is assessed each quarter based on the net investment in the foreign subsidiary designated as the hedged item and the changes in the fair value of designated forward contracts based on spot rates. For hedges that meet the effectiveness requirements, changes in fair value are recorded as a component of other comprehensive income (loss), net of tax. As of December 31, 2018, there was no ineffectiveness on the instruments designated as net investment hedges.

The following table presents the balance sheet location and fair value of the derivative instruments designated as net investment hedges:

Fair Value of
Asset
(Liability)

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	Balance Sheet Location	December 31,	
		2018	2017
Foreign currency contracts	Prepaid expenses and other current assets	\$ 788	\$—
Foreign currency contracts	Other accrued liabilities	—	(403)
Total derivatives designated as			
hedging instruments		\$ 788	\$(403)

The after tax impact of the forward contracts designated as net investment hedging instruments, both matured and outstanding, on the Consolidated Statements of Operations and Comprehensive Income is as follows:

Foreign Currency Forward Contracts	Location of Gain (Loss)	Effective Portion of Gain (Loss)	Recognized
Year ended December 31, 2018	Other comprehensive income (loss), net of tax		\$ 3,537
Year ended December 31, 2017	Other comprehensive income (loss), net of tax		\$ (4,981)
Year ended December 31, 2016	Other comprehensive income (loss), net of tax		\$ —

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

8. FAIR VALUE MEASUREMENTS

The Company's financial instruments consist primarily of cash and cash equivalents, trade receivables, trade payables, debt instruments and foreign currency contracts. For cash and cash equivalents, trade receivables and trade payables, the carrying amounts of these financial instruments as of December 31, 2018 and December 31, 2017 were considered representative of their fair values due to their short terms to maturity. The fair values of the Company's debt instruments and foreign currency contracts were based on indicative quotes.

Fair value measurements using quoted prices in active markets for identical assets and liabilities fall within Level 1 of the fair value hierarchy, measurements using significant other observable inputs fall within Level 2, and measurements using significant unobservable inputs fall within Level 3.

The carrying amounts, estimated fair values and valuation input levels of the Company's foreign currency contracts and debt instruments as of December 31, 2018 and December 31, 2017, are as follows:

	December 31, 2018		December 31, 2017		Valuation Inputs
	Carrying Amount	Fair Value	Carrying Amount	Fair Value	
Assets:					
Foreign currency contracts	\$2,491	\$2,491	\$9,050	\$9,050	Level 2
Liabilities:					
5.00% senior notes due 2027	750,000	608,025	750,000	753,750	Level 2
6.00% senior notes due 2025	1,500,000	1,355,550	1,500,000	1,591,800	Level 2
5.50% senior notes due 2024	650,000	591,825	650,000	676,780	Level 2
5.00% senior notes due 2021	650,000	641,875	650,000	661,375	Level 2
Senior secured term loan due 2022, at par	486,250	461,938	886,250	892,343	Level 2
Foreign currency contracts	3,044	3,044	977	977	Level 2

Non-Recurring Fair Value Measurements

During the fourth quarter of 2018, the Company recorded a pretax charge of \$15.0 million that was allocated equally to the CCS and CMS segments to fully impair our equity investment in a privately-held company. The determination of the impairment charge was based on Level 3 valuation inputs.

These fair value estimates are based on pertinent information available to management as of the valuation date. Although management is not aware of any factors that would significantly affect these fair value estimates, such amounts have not been comprehensively revalued for purposes of these financial statements since those dates, and current estimates of fair value may differ significantly from the amounts presented.

9. RESTRUCTURING COSTS

The Company incurs costs associated with restructuring initiatives intended to improve overall operating performance and profitability. The costs related to restructuring actions are generally composed of employee-related costs, lease termination costs and fixed asset related costs. Employee-related costs include the expected severance costs and related benefits as well as one-time severance benefits that are accrued over the remaining period employees are

required to work in order to receive such benefits. Lease termination costs include the discounted cost of unused leased facilities, net of anticipated sub-rental income. Fixed asset related costs include non-cash impairments or fixed asset disposals associated with restructuring actions in addition to the cash costs to uninstall, pack, ship and reinstall manufacturing equipment and the costs to prepare the receiving facility to accommodate relocated equipment. Fixed asset related costs are expensed as incurred. Cash paid is net of proceeds received from the sale of related assets.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

As a result of restructuring and consolidation actions, the Company owns unutilized real estate at various facilities both inside and outside the U.S. The Company is attempting to sell or lease this unutilized space. Additional impairment charges may be incurred related to these or other excess assets.

The Company's net pretax restructuring charges, by segment, were as follows:

	Year Ended December 31,		
	2018	2017	2016
CCS	\$24,201	\$36,551	\$27,098
CMS	19,824	7,231	15,777
Total	\$44,025	\$43,782	\$42,875

Restructuring reserves were included in the Company's Consolidated Balance Sheets as follows:

	December 31,	
	2018	2017
Other accrued liabilities	\$29,876	\$24,961
Other noncurrent liabilities	5,179	7,036
Total liability	\$35,055	\$31,997

Cost Alignment Restructuring Actions

Prior to the acquisition of TE Connectivity's Broadband Network Solutions (BNS) business in August 2015, the Company initiated restructuring actions to realign and lower its cost structure, primarily through workforce reductions and other cost reduction initiatives, including the cessation of manufacturing operations at various facilities. As of December 31, 2018, these actions were substantially complete except for a \$5.6 million liability for lease termination costs, for which the Company expects to make cash payments, net of sublease income, of \$1.9 million during 2019 and make the remaining payments of \$3.7 million between 2020 and 2022.

BNS Integration Restructuring Actions

Following the acquisition of BNS, the Company initiated a series of restructuring actions, which are currently ongoing, to integrate and streamline operations and achieve cost synergies. The activity within the liability established for the BNS integration restructuring actions was as follows:

	Employee- Related Costs	Lease Termination Costs	Fixed Asset Related Costs	Total
Balance at December 31, 2015	\$ 28,714	\$ —	\$ —	\$28,714
Additional charge recorded	35,848	378	6,483	42,709
Cash paid	(31,569)	(256)	(3,079)	(34,904)
Foreign exchange and other non-cash items	(253)	249	(3,404)	(3,408)
Balance at December 31, 2016	32,740	371	—	33,111
Additional charge recorded	33,565	1,352	8,202	43,119
Cash paid	(41,084)	(648)	(582)	(42,314)

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Consideration received	—	—	2,699	2,699
Foreign exchange and other non-cash items	367	5	(10,319)	(9,947)
Balance at December 31, 2017	25,588	1,080	—	26,668
Additional charge recorded	41,040	1,570	(821)	41,789
Cash paid	(37,073)	(2,343)	(803)	(40,219)
Consideration received	—	—	11,123	11,123
Foreign exchange and other non-cash items	(376)	(23)	(9,499)	(9,898)
Balance at December 31, 2018	\$ 29,179	\$ 284	\$ —	\$29,463

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The BNS integration actions include the announced closures or reduction in activities at various U.S. and international facilities as well as headcount reductions in sales, marketing and administrative functions. The Company has recognized restructuring charges of \$151.4 million since the BNS acquisition for integration actions. No significant additional restructuring charges are expected to be incurred to complete the previously announced BNS integration initiatives. The Company expects to make cash payments of \$28.0 million during 2019 and additional cash payments of \$1.5 million between 2020 and 2021. Future restructuring actions may be identified and the resulting charges and cash requirements may be material.

10. EMPLOYEE BENEFIT PLANS

Defined Contribution Plans

The Company and certain of its subsidiaries have defined contribution retirement savings plans, the most significant of which is a 401(k) plan in the U.S. These plans allow employees meeting certain requirements to contribute a portion of their compensation on a pretax and/or after-tax basis in accordance with guidelines established by the plans and the Internal Revenue Service or other tax authorities. The Company matches a percentage of the employee contributions up to certain limits. During the years ended December 31, 2018, 2017 and 2016, the Company made contributions to defined contribution retirement savings plans of \$24.0 million, \$25.9 million and \$24.5 million, respectively.

The Company maintains noncontributory and contributory deferred compensation plans. During the years ended December 31, 2018, 2017 and 2016, the Company recognized pretax costs of \$0.7 million, \$2.9 million and \$2.6 million, respectively, related to these plans. The liability related to these plans was \$32.6 million and \$38.7 million as of December 31, 2018 and 2017, respectively.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Pension Plans

The Company sponsors defined benefit pension plans covering certain domestic former employees and certain foreign current and former employees. Included in the defined benefit pension plans are both funded and unfunded plans. The following table summarizes information for the defined benefit pension plans:

	December 31,			
	U.S. Plans		Non-U.S. Plans	
	2018	2017	2018	2017
Change in benefit obligation:				
Benefit obligation, beginning	\$ 156,729	\$ 156,522	\$ 240,749	\$ 216,634
Service cost	—	—	4,097	4,876
Interest cost	4,205	5,929	5,157	5,300
Plan participants' contributions	—	—	129	116
Actuarial loss (gain)	(4,585)	5,100	(17,983)	(2,670)
Plan amendments	—	—	372	432
Benefits paid	(10,730)	(10,822)	(9,428)	(6,583)
Settlements	(143,389)	—	(784)	—
Foreign exchange and other	—	—	(13,491)	22,644
Benefit obligation, ending	\$ 2,230	\$ 156,729	\$ 208,818	\$ 240,749
Change in plan assets:				
Fair value of plan assets, beginning	\$ 160,988	\$ 155,638	\$ 226,512	\$ 196,818
Employer and plan participant contributions	1,697	260	5,648	4,990
Return on plan assets	(8,565)	15,912	(6,720)	9,955
Benefits paid	(10,730)	(10,822)	(9,428)	(6,583)
Settlements	(143,390)	—	(784)	—
Foreign exchange and other	—	—	(11,848)	21,332
Fair value of plan assets, ending	\$ —	\$ 160,988	\$ 203,380	\$ 226,512
Funded status, net liability or (net asset)	\$ 2,230	\$(4,259)	\$ 5,438	\$ 14,237

The following table presents the balance sheet location of the Company's pension liabilities and assets:

	December 31,			
	U.S. Plans		Non-U.S. Plans	
	2018	2017	2018	2017
Other accrued liabilities	\$(260)	\$(260)	\$(281)	\$(1,235)
Pension and other postretirement benefit liabilities	(1,970)	(2,152)	(11,329)	(18,176)
Other noncurrent assets	—	6,671	6,172	5,174

The Company terminated a significant U.S. defined benefit pension plan in the fourth quarter of 2018 through the purchase of annuities. The Company contributed \$1.4 million to the plan during the year ended December 31, 2018, which was needed to fund the termination of the plan. Upon termination, the Company recognized a pretax charge in other expense, net, of \$34.5 million primarily related to unrecognized net actuarial losses previously recorded in accumulated other comprehensive loss.

The accumulated benefit obligation for the Company's U.S. defined benefit pension plans was \$2,230 and \$156,729 as of December 31, 2018 and 2017, respectively and the accumulated benefit obligation for the Company's non-U.S. defined benefit pension plans was \$174,588 and \$195,922 as of December 31, 2018 and 2017, respectively.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table summarizes information for the Company's pension plans with an accumulated benefit obligation in excess of plan assets:

	December 31,			
	U.S. Plans		Non-U.S. Plans	
	2018	2017	2018	2017
Projected benefit obligation	\$2,230	\$2,412	\$13,053	\$16,755
Accumulated benefit obligation	2,230	2,412	11,546	14,683
Fair value of plan assets	—	—	3,760	4,034

The following table summarizes pretax amounts included in accumulated other comprehensive loss:

	December 31,			
	U.S. Plans		Non-U.S. Plans	
	2018	2017	2018	2017
Unrecognized net actuarial loss	\$(415)	\$(26,261)	\$(22,784)	\$(28,410)
Unrecognized prior service cost	—	—	(748)	(437)
Total	\$(415)	\$(26,261)	\$(23,532)	\$(28,847)

Actuarial gains and losses are amortized using a corridor approach. The corridor is equal to 10% of the greater of the benefit obligation and the fair value of the assets. Gains and losses in excess of the corridor are generally amortized over the average remaining life of the plan participants. Pretax amounts for net periodic benefit cost and other amounts included in other comprehensive income (loss) for the defined benefit pension plans consisted of the following components:

	Year Ended December 31,					
	U.S. Plans			Non-U.S. Plans		
	2018	2017	2016	2018	2017	2016
Service cost	\$—	\$—	\$—	\$4,097	\$4,876	\$5,352
Interest cost	4,205	5,929	6,452	5,157	5,300	6,096
Recognized actuarial loss	388	664	923	1,298	1,523	116
Expected return on plan assets	(5,058)	(6,769)	(7,002)	(7,686)	(7,598)	(8,632)
Settlement loss	34,495	—	—	15	—	—
Net periodic benefit cost (income)	34,030	(176)	373	2,881	4,101	2,932
Changes in plan assets and benefit obligations						
included in other comprehensive income (loss):						
Change in unrecognized net actuarial loss (gain)	8,649	(4,707)	(6,540)	(5,626)	(4,001)	23,750
Change in unrecognized prior service cost	—	—	—	311	437	—
Settlement	(34,495)	—	—	—	—	—
Total included in other comprehensive income (loss)	(25,846)	(4,707)	(6,540)	(5,315)	(3,564)	23,750
Total recognized in net periodic benefit cost and						
included in other comprehensive income (loss)	\$8,184	\$(4,883)	\$(6,167)	\$(2,434)	\$537	\$26,682

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Assumptions

Significant weighted average assumptions used in determining benefit obligations and net periodic benefit cost are as follows:

	U.S. Plans			Non-U.S. Plans		
	2018	2017	2016	2018	2017	2016
Benefit obligations:						
Discount rate	3.70 %	3.50 %	3.94 %	2.50 %	2.23 %	2.38 %
Rate of compensation increase	— %	— %	— %	3.92 %	3.92 %	4.04 %
Net periodic benefit cost:						
Discount rate	3.50 %	3.94 %	4.19 %	2.23 %	2.38 %	3.52 %
Rate of return on plan assets	— %	4.10 %	4.50 %	3.41 %	3.49 %	3.71 %
Rate of compensation increase	— %	— %	— %	3.92 %	4.04 %	4.18 %

The Company considered the available yields on high-quality fixed-income investments with maturities corresponding to the Company's expected benefit obligations to determine the discount rates at each measurement date.

Plan Assets

In developing the expected rate of return on plan assets, the Company considered the expected long-term rate of return on individual asset classes. Expected return on plan assets is based on the market value of the assets. A portion of the non-U.S. pension assets are managed by independent investment advisors with an objective of transitioning to a portfolio of fixed income and absolute return investments that matches the durations of the obligations as the funded status of each plan improves. The absolute return investment fund is a diversified portfolio designed to achieve long-term total returns. The remainder of the non-U.S. pension assets is invested with the objective of maximizing return.

Mutual funds classified as Level 1 are valued at net asset value, which is based on the fair value of the funds' underlying securities. Certain mutual funds are classified as Level 2 because a portion of the funds' underlying assets are valued using significant other observable inputs. Other assets are primarily composed of fixed income investments (including insurance and real estate products) and are valued based on the investment's stated rate of return, which approximates market interest rates.

The Company had no U.S. defined benefit pension plan assets as of December 31, 2018. The estimated fair values and the valuation input levels of the Company's non-U.S. defined benefit pension plan assets are as follows:

December 31, 2018
 Non-U.S. Plans
 Level 1 Level 2

	Fair Value	Fair Value
Mutual funds:		
International equity	\$22,607	\$25,503
International debt	36,142	82,429
Absolute return	—	26,168
Other	2,858	7,673
Total	\$61,607	\$141,773

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The estimated fair values and the valuation input levels of the Company's plan assets are as follows:

	December 31, 2017			
	U.S. Plans		Non-U.S. Plans	
	Level		Level	
	Level 1	2	Level 1	Level 2
	Fair Value	Fair Value	Fair Value	Fair Value
Mutual funds:				
U.S. equity	\$257	\$ —	\$—	\$—
International equity	1,934	—	34,704	26,781
U.S. debt	145,967	—	—	—
International debt	10,252	—	31,192	98,789
Absolute return	—	—	—	21,994
Other	2,578	—	6,645	6,407
Total	\$160,988	\$ —	\$72,541	\$153,971

Expected Cash Flows

The Company expects to contribute \$0.3 million to U.S defined benefit pension plans and \$4.7 million to non-U.S. defined benefit pension plans during 2019.

The following table summarizes projected benefit payments from pension plans through 2028, including benefits attributable to estimated future service (in millions):

	U.S. Plans	Non-U.S. Plans
2019	\$0.3	\$ 9.4
2020	0.3	8.1
2021	0.3	8.9
2022	0.3	9.1
2023	0.3	9.3
2024-2028	1.3	65.2

Other Postretirement Benefit Plans

The Company sponsors postretirement health care and life insurance benefit plans that provide benefits to certain former U.S. employees and certain U.S. full-time employees who retire from the Company. The health care plans contain various cost-sharing features such as participant contributions, deductibles, coinsurance and caps, with Medicare as the primary provider of health care benefits for eligible retirees. The Company amended certain of the plans to terminate benefits as of December 31, 2018 and recognized a pre-tax gain of \$9.7 million in other expense,

net, primarily related to the reclassification of unrecognized prior service credits and unrecognized net actuarial gains from accumulated other comprehensive loss. The accounting for the remainder of the health care plans anticipates future cost-sharing changes that are consistent with the Company's expressed intent to maintain a consistent level of cost sharing or capped benefits with retirees. There are no plan assets associated with these post-retirement health care and life insurance benefit plans.

The benefit obligation for the remaining plans was \$4.2 million and \$5.7 million as of December 31, 2018 and 2017, respectively, primarily recorded in pension and other postretirement liabilities on the Consolidated Balance Sheets. The pretax gains recognized in accumulated other comprehensive loss were \$3.1 million and \$18.7 million for the years ended December 31, 2018 and 2017, respectively, mostly related to unrecognized prior service credits. The net periodic benefit income of \$7.4 million (excluding the gain discussed above related to the termination of certain benefits), \$4.7 million and \$5.1 million for the years ended December 31, 2018, 2017 and 2016, respectively, resulted primarily from the amortization of net actuarial gains and prior service credits.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

11. INCOME TAXES

On December 22, 2017, the U.S. government enacted tax reform legislation (U.S. tax reform) that reduced the corporate income tax rate from 35% to 21% and included a broad range of complex provisions affecting the taxation of businesses. Generally, financial statement recognition of the new legislation would be required to be completed in the period of enactment; however, in response to the complexities of this new legislation, the SEC staff issued Staff Accounting Bulletin No. 118 (SAB 118) to provide companies with transitional relief. Specifically, SAB 118 provided up to one year from the date of enactment for companies to finalize the accounting for the effects of this new legislation. During the year ended December 31, 2018, the Company recognized a \$7.8 million tax benefit related to changes made to the provisional amounts, primarily related to the Company's transition tax and from revaluing the Company's U.S. deferred tax assets and liabilities. The Company has elected to record taxes related to the Global Intangible Low-taxed Income (GILTI) as a period cost.

Income before income taxes includes the results from domestic and international operations as follows:

	Year Ended December 31,		
	2018	2017	2016
U.S. companies	\$63,975	\$89,214	\$2,752
Non-U.S. companies	106,737	120,518	269,817
Income before income taxes	\$170,712	\$209,732	\$272,569

The components of income tax expense were as follows:

	Year Ended December 31,		
	2018	2017	2016
Current:			
Federal	\$9,635	\$17,015	\$37,495
Foreign	64,740	64,756	104,196
State	5,367	5,672	8,918
Current income tax expense	79,742	87,443	150,609
Deferred:			
Federal	(26,123)	(57,953)	(68,486)
Foreign	(20,548)	(11,662)	(28,100)
State	(2,576)	(1,860)	(4,292)
Deferred income tax benefit	(49,247)	(71,475)	(100,878)
Total income tax expense	\$30,495	\$15,968	\$49,731

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The reconciliation of income taxes calculated at the statutory U.S. federal income tax rate to the Company's provision for income taxes was as follows:

	Year Ended December 31,		
	2018	2017	2016
Provision for income taxes at federal statutory rate	\$35,849	\$73,406	\$95,399
State income taxes, net of federal tax effect	7,637	7,107	6,211
Other permanent items	8,042	4,530	1,328
Equity-based compensation	(4,594)	(13,373)	1,449
U.S. tax reform	(7,801)	(22,358)	—
Other changes in tax laws or rates	(185)	(17,121)	(379)
Goodwill related items	—	—	3,284
GILTI	5,954	—	—
Federal tax credits	(2,340)	(2,497)	(1,600)
Change in unrecognized tax benefits	(22,247)	(8,372)	(11,061)
Foreign dividends and Subpart F income, net of foreign tax credits	4,919	8,584	16,848
Foreign earnings taxed at other than federal rate	1,118	(9,734)	(31,148)
Tax provision adjustments and revisions to prior years' returns	(5,528)	(6,652)	3,412
Change in valuation allowances	9,671	2,448	(34,012)
Total provision for income taxes	\$30,495	\$15,968	\$49,731

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The components of deferred income tax assets and liabilities and the classification of deferred tax balances on the balance sheet were as follows:

	December 31,	
	2018	2017
Deferred tax assets:		
Accounts receivable, inventory and warranty reserves	\$45,092	\$40,763
Employee benefits	28,698	24,391
Foreign net operating loss and tax credit carryforwards	85,848	65,088
Federal net operating loss carryforwards	1,717	2,024
Federal tax credit carryforwards	57,287	75,856
State net operating loss and tax credit carryforwards	18,519	20,189
Transaction costs	11,759	9,153
Unrecognized tax benefits	7,973	10,468
Interest limitation	13,517	—
Capitalized research and development costs	12,578	1,013
Other	19,042	22,179
Total deferred tax assets	302,030	271,124
Valuation allowance	(85,110)	(67,956)
Total deferred tax assets, net of valuation allowance	216,920	203,168
Deferred tax liabilities:		
Intangible assets	(205,542)	(234,591)
Property, plant and equipment	(36,374)	(29,073)
Undistributed foreign earnings	(11,756)	(21,415)
Other	(3,704)	(6,394)
Total deferred tax liabilities	(257,376)	(291,473)
Net deferred tax liability	\$(40,456)	\$(88,305)
Deferred taxes recognized on the balance sheet:		
Noncurrent deferred tax asset (included with other noncurrent assets)	42,885	\$45,936
Noncurrent deferred tax liability	(83,341)	(134,241)
Net deferred tax liability	\$(40,456)	\$(88,305)

The deferred tax asset for federal tax credit carryforwards as of December 31, 2018 relates to U.S. foreign tax credit carryforwards that expire between 2021 and 2025.

The deferred tax asset for state net operating loss and tax credit carryforwards as of December 31, 2018 includes state net operating loss carryforwards (net of federal tax impact) of \$17.2 million, which begin to expire in 2019, and state tax credit carryforwards (net of federal tax impact) of \$1.3 million which begin to expire in 2019. A valuation allowance of \$14.9 million has been established against these and other state income tax related deferred tax assets.

The deferred tax assets for foreign net operating loss and tax credit carryforwards as of December 31, 2018 includes foreign net operating loss carryforwards (net of federal tax effects) of \$74.7 million, which will begin to expire in 2019, and foreign tax credit carryforwards (net of federal tax effects) of \$11.1 million, which begin to expire in 2023. Certain of these foreign net operating loss carryforwards are subject to local restrictions limiting their utilization.

Valuation allowances of \$63.0 million have been established related to these foreign deferred tax assets.

In addition to the valuation allowances detailed above, the Company has also established a valuation allowance of \$7.2 million against other deferred tax assets.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Following enactment of U.S. tax reform and the associated one-time transition tax, in general, repatriation of foreign earnings to the U.S. can be completed with no incremental U.S. tax. However, repatriation of foreign earnings could subject the Company to U.S. state and non-U.S. jurisdictional taxes (including withholding taxes) on distributions. As of December 31, 2018, the Company has a deferred tax liability of \$11.8 million for the estimated foreign and state tax costs associated with the expected repatriation of the Company's undistributed foreign earnings. The unrecorded deferred tax liability for foreign and state tax costs associated with earnings considered permanently reinvested is not material as of December 31, 2018.

The following table reflects a reconciliation of the beginning and end of period amounts of gross unrecognized tax benefits, excluding interest and penalties:

	Year Ended December 31,		
	2018	2017	2016
Balance at beginning of period	\$46,635	\$48,312	\$64,085
Increase related to prior periods	3,993	9,076	742
Decrease related to prior periods	(691)	(722)	(3,416)
Increase related to current periods	—	1,117	—
Decrease related to settlements with taxing authorities	(3,930)	(764)	(22)
Decrease related to lapse in statutes of limitations	(25,936)	(10,384)	(16,758)
Increase related to acquisition	—	—	3,681
Balance at end of period	\$20,071	\$46,635	\$48,312

The Company's liability for unrecognized tax benefits that, if recognized, would favorably affect the effective tax rate in future periods was \$13.0 million as of December 31, 2018. The Company operates in numerous jurisdictions worldwide and is subject to routine tax audits on a regular basis. The determination of the Company's unrecognized tax benefits involves significant management judgment regarding interpretation of relevant facts and tax laws in each of these jurisdictions.

Unrecognized tax benefits are reviewed and evaluated on an ongoing basis and may be adjusted for changing facts and circumstances including the lapse of applicable statutes of limitation and closure of tax examinations. Although the timing and outcome of such events are difficult to predict, the Company estimates that the balance of unrecognized tax benefits, excluding the impact of accrued interest and penalties, may be reduced by up to \$5.0 million within the next twelve months.

The Company provides for interest and penalties related to unrecognized tax benefits as income tax expense. As of December 31, 2018 and 2017, the Company had accrued \$5.2 million and \$9.0 million, respectively, for interest and penalties. During the years ended December 31, 2018, 2017 and 2016 the net expense (benefit) for interest and penalties recognized through income tax expense was \$(3.8) million, \$0.1 million and \$0.4 million, respectively.

The Company files federal, state and local tax returns with statutes of limitation generally ranging from 3 to 4 years. The Company is generally no longer subject to federal tax examinations for years prior to 2015 or state and local tax examinations for years prior to 2014. Tax returns filed by the Company's significant foreign subsidiaries are generally subject to statutes of limitations of 3 to 7 years and are generally no longer subject to examination for years prior to 2013. In many jurisdictions, tax authorities retain the ability to review prior years' tax returns and to adjust any net operating loss or tax credit carryforwards from these years that are available to be utilized in subsequent periods. During 2018, the Company recognized \$29.9 million related to the lapse of applicable statutes of limitations and the

conclusion of various domestic and foreign examinations.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table presents income tax expense (benefit) related to amounts presented in other comprehensive income (loss):

	Year Ended December 31,		
	2018	2017	2016
Foreign currency translation	\$(1,907)	\$(1,697)	\$(188)
Defined benefit plans	3,964	668	(1,659)
Available-for-sale securities	—	(1,605)	(2,360)
Total	\$2,057	\$(2,634)	\$(4,207)

12. STOCKHOLDERS' EQUITY

Stock Repurchase Program

During the year ended December 31, 2017, the Company repurchased 4.8 million shares of its outstanding common stock at an average cost of \$36.50 per share. The Company did not repurchase any of its common stock during the year ended December 31, 2018.

Equity-Based Compensation Plans

The Company's Board of Directors approved the 2013 Long Term Incentive Plan (the 2013 Plan), effective October 24, 2013, authorizing 18.6 million shares for issuance. Awards under the 2013 Plan may include stock, stock options, restricted stock, restricted stock units (RSUs), performance units, performance share units (PSUs), performance-based restricted stock, stock appreciation rights and dividend equivalent rights for employees and non-employee directors of the Company. Approval of the 2013 Plan canceled all shares authorized but not issued under predecessor plans. Awards granted prior to October 24, 2013 remain subject to the provisions of the predecessor plans. As of December 31, 2018, 10.6 million shares were available for future grants under the 2013 Plan.

As of December 31, 2018, \$54.4 million of total unrecognized compensation expense related to non-vested stock options, RSUs and PSUs is expected to be recognized over a remaining weighted average period of 1.4 years. There were no significant capitalized equity-based compensation costs at December 31, 2018.

The following table shows a summary of the equity-based compensation expense included in the Consolidated Statements of Operations and Comprehensive Income:

	Year Ended December 31,		
	2018	2017	2016
Selling, general and administrative	\$34,206	\$31,879	\$26,709
Cost of sales	5,681	5,297	4,665
Research and development	5,012	4,674	3,632
Total equity-based compensation expense	\$44,899	\$41,850	\$35,006

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Stock Options

Stock options are awards that allow the recipient to purchase shares of the Company's common stock at a fixed price. Stock options are granted at an exercise price equal to the Company's stock price at the date of grant. These awards generally vest over three years following the grant date and have a contractual term of ten years.

The following table summarizes the stock option activity (in thousands, except per share data and years):

	Weighted		Weighted	Aggregate
	Average Option			
	Exercise	Price	Average Remaining Contractual Term	Intrinsic Value
	Shares	Per Share	in Years	
Options outstanding as of December 31, 2017	4,830	\$ 13.01		
Granted	482	\$ 38.34		
Exercised	(570)	\$ 10.75		
Forfeited	(90)	\$ 34.09		
Options outstanding as of December 31, 2018	4,652	\$ 15.51	3.9	\$ 31,467
Options vested at December 31, 2018	3,838	\$ 10.98	2.8	\$ 31,467
Options unvested at December 31, 2018	814	\$ 36.84	8.6	\$ —

The total intrinsic value of options exercised during the years ended December 31, 2018, 2017 and 2016 was \$12.7 million, \$31.2 million and \$50.6 million, respectively.

The exercise prices of outstanding options at December 31, 2018 were in the following ranges (in thousands, except per share data and years):

Range of Exercise Prices	Options Outstanding		Options Exercisable	
	Shares	Weighted Average	Remaining Contractual Life	Weighted Average Exercise
	Shares	Price Per Share	in years	Price Per Share

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\$2.96 to \$5.74	2,498	1.9	\$ 5.42	2,498	\$ 5.42
\$5.75 to \$22.99	523	1.4	\$ 8.59	523	\$ 8.59
\$23.00 to \$42.32	1,631	7.7	\$ 33.16	817	\$ 29.49
\$2.96 to \$42.32	4,652	3.9	\$ 15.51	3,838	\$ 10.98

The Company uses the Black-Scholes model to estimate the fair value of stock option awards at the date of grant. Key inputs and assumptions used in the model include the grant date fair value of a share of common stock, exercise price of the award, the expected option term, the risk-free interest rate, stock price volatility, and the Company's projected dividend yield. The expected term represents the period over which the Company's employees are expected to hold their options. The risk-free interest rate reflects the yield on zero-coupon U.S. treasury securities with a term equal to the option's expected term. Expected volatility is derived based on the historical volatility of the Company's stock. The Company's projected dividend yield is zero. The Company believes that the valuation technique and the approach utilized to develop the underlying assumptions are appropriate in estimating the fair values of its stock options. Estimates of fair value are not intended to predict actual future events or the value ultimately realized by employees who receive equity awards. Subsequent events are not indicative of the reasonableness of the original estimates of fair value made by the Company.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table presents the weighted average assumptions used to estimate the fair value of stock option awards granted:

	Year Ended December 31,					
	2018		2017		2016	
Expected option term (in years)	6.0		6.0		6.0	
Risk-free interest rate	2.7	%	2.0	%	1.4	%
Expected volatility	35.0	%	40.0	%	50.0	%
Weighted average exercise price	\$38.34		\$38.00		\$25.08	
Weighted average fair value at grant date	\$14.83		\$15.72		\$12.09	

Restricted Stock Units

RSUs entitle the holder to shares of common stock after a vesting period that generally ranges from one to three years. The fair value of the awards is determined on the grant date based on the Company's stock price.

The following table summarizes the RSU activity (in thousands, except per share data):

	Weighted	
	Average Grant	
	Restricted Stock	Date Fair Value
	Units	Per Share
Non-vested share units at December 31, 2017	2,279	\$ 31.83
Granted	1,131	\$ 37.87
Vested and shares issued	(1,105)) \$ 30.82
Forfeited	(269)) \$ 34.13
Non-vested share units at December 31, 2018	2,036	\$ 35.43

The weighted average grant date fair value per unit of these awards granted during the years ended December 31, 2018, 2017 and 2016 was \$37.87, \$37.90 and \$24.93, respectively. The total fair value of RSUs that vested during the years ended December 31, 2018, 2017 and 2016 was \$42.1 million, \$42.9 million and \$13.6 million, respectively.

Performance Share Units

PSUs are stock awards in which the number of shares ultimately received by the employee depends on Company performance against specified targets. Such awards typically vest over three years and the number of shares issued can vary from 0% to 200% of the number of PSUs granted, depending on performance. The fair value of each PSU is determined on the date of grant based on the Company's stock price. Over the performance period, the number of shares that are expected to be issued is adjusted upward or downward based upon the probable achievement of performance targets. The ultimate number of shares issued and the related compensation cost recognized is based on the final performance metrics compared to the targets specified in the grants. For PSUs granted in 2018 that had a 2018 earnings-based performance measure, the performance was below target resulting in a negative share performance adjustment.

CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The following table summarizes the PSU activity (in thousands, except per share data):

	Share Units	Weighted Average Grant Performance Date Fair Value Per Share
Non-vested share units at December 31, 2017	344	\$ 26.75
Granted	187	\$ 38.34
Vested and shares issued	(203)	\$ 26.80
Forfeited	(32)	\$ 26.41
Performance adjustment	(34)	\$ 38.34
Non-vested share units at December 31, 2018	262	\$ 33.52

The weighted average grant date fair value per unit of these awards granted during the years ended December 31, 2018, 2017 and 2016 was \$38.34, \$38.00 and \$25.05, respectively. The total fair value of PSUs that vested during the years ended December 31, 2018 and 2017 was \$7.9 million and \$2.4 million, respectively. No PSUs vested during the year ended December 31, 2016.

13. COMMITMENTS AND CONTINGENCIES

The Company leases certain equipment and facilities under operating leases expiring at various dates through 2027. Rent expense was \$42.3 million, \$39.6 million and \$41.1 million for the years ended December 31, 2018, 2017 and 2016, respectively. Future minimum rental payments required under operating leases having an initial term in excess of one year at December 31, 2018 are as follows (in millions):

	Operating Leases
2019	\$ 35.7
2020	29.1
2021	24.3
2022	11.9
2023	7.4
Thereafter	11.3
Total minimum lease payments	\$ 119.7

The following table summarizes the activity in the product warranty accrual, included in other accrued liabilities:

	Year Ended December 31,		
	2018	2017	2016
Product warranty accrual, beginning of period	\$ 16,928	\$ 21,631	\$ 17,964
Provision for warranty claims	6,193	4,333	10,745

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Warranty claims paid	(7,437)	(9,182)	(7,337)
Foreign exchange	(54)	146	259
Product warranty accrual, end of period	\$15,630	\$16,928	\$21,631

In addition, the Company is subject to various federal, state, local and foreign laws and regulations governing the use, discharge, disposal and remediation of hazardous materials. Compliance with current laws and regulations has not had, and is not expected to have, a materially adverse effect on the Company's financial condition or results of operations.

Legal Proceedings

The Company is either a plaintiff or a defendant in certain pending legal matters in the normal course of business. The Company may also be called upon to indemnify certain customers for costs related to products or services sold to such customers. Management believes none of these legal matters will be material to the Company's business or financial condition upon final disposition.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

14. INDUSTRY SEGMENTS, MAJOR CUSTOMERS, RELATED PARTY TRANSACTIONS AND GEOGRAPHIC INFORMATION

Segment Information

The Company reports financial performance based on two operating segments: CommScope Connectivity Solutions and CommScope Mobility Solutions.

The CCS segment provides innovative fiber optic and copper cable and connectivity solutions for use in data centers and business enterprise, telecommunications, cable television and residential broadband networks. The CCS portfolio includes network solutions for indoor and outdoor network applications. Indoor network solutions are found in commercial buildings and data centers. These solutions include optical fiber and twisted pair structured cabling solutions, intelligent infrastructure management hardware and software, high-density fiber optic connectivity, fiber management systems, patch cords and panels, pre-terminated fiber connectivity, complete cabling systems and cable assemblies for use in offices and data centers. Outdoor network solutions are found in both local-area and wide-area networks, central offices and headends, and “last-mile” fiber-to-the-home installations, including deployments of fiber-to-the-node (FTTN), fiber-to-the-premises (FTTP) and fiber-to-the-distribution point (FTTdP) to homes, businesses and cell sites. These solutions support the multichannel video, voice and high-speed data services provided by telecommunications operators and multi-system operators. The Company’s fiber optic connectivity solutions are primarily comprised of hardened connector systems, fiber distribution hubs and management systems, couplers and splitters, plug and play multiport service terminals, hardened optical terminating enclosures, high density cable assemblies, splices and splice closures.

The CMS segment provides the integral building blocks for cellular base station sites and related connectivity; indoor, small cell and distributed antenna wireless systems; and wireless network backhaul planning and optimization products and services. These solutions enable wireless operators to increase spectral efficiency and enhance cellular coverage and capacity in challenging network conditions such as commercial buildings, urban areas, stadiums and transportation systems. The CMS segment focuses on all aspects of the radio access network (RAN) from the macro through the metro to the indoor layer. Macro cell solutions can be found at wireless tower sites and on rooftops and include base station antennas, microwave antennas, hybrid fiber-feeder and power cables, coaxial cables, connectors and filters. Metro cell solutions can be found on street poles and on other urban, outdoor structures and include radio frequency (RF) delivery and connectivity solutions, equipment housing and concealment. These fully integrated outdoor systems are comprised of specialized antennas, filters/combiners, backhaul solutions, intra-system cabling and power distribution, all minimized to fit an urban environment. Distributed antenna systems and small cell indoor solutions allow wireless operators to increase spectral efficiency and thereby extend and enhance cellular coverage and capacity in challenging network conditions.

The following table provides summary financial information by reportable segment (in millions):

	December 31,	
	2018	2017
Identifiable segment-related assets:		
CCS	\$4,258.1	\$4,546.0
CMS	1,871.3	1,995.8
Total identifiable segment-related assets	6,129.4	6,541.8

Reconciliation to total assets:		
Cash and cash equivalents	458.2	454.0
Deferred income tax assets	42.9	45.9
Total assets	\$6,630.5	\$7,041.7

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

The Company's measure of segment performance is adjusted operating income. The Company defines adjusted operating income as operating income, adjusted to exclude amortization, restructuring costs, asset impairments, equity-based compensation and other items that the Company believes are useful to exclude in the evaluation of operating performance from period to period because these items are not representative of the Company's core business.

The following table provides net sales, adjusted operating income, depreciation expense and additions to property, plant and equipment by reportable segment (in millions):

	Year Ended December 31,		
	2018	2017	2016
Net sales:			
CCS	\$2,812.7	\$2,809.8	\$2,965.5
CMS	1,755.8	1,750.8	1,958.1
Consolidated net sales	\$4,568.5	\$4,560.6	\$4,923.6
Segment adjusted operating income:			
CCS	\$521.8	\$523.3	\$628.5
CMS	316.2	353.4	415.7
Total adjusted operating income	838.0	876.7	1,044.2
Amortization of intangible assets	(264.6)	(271.0)	(297.2)
Restructuring costs, net	(44.0)	(43.8)	(42.9)
Equity-based compensation	(44.9)	(41.9)	(35.0)
Asset impairments	(15.0)	—	(38.6)
Integration and transaction costs	(19.5)	(48.0)	(62.3)
Purchase accounting adjustments	—	—	(0.6)
Consolidated operating income	\$450.0	\$472.0	\$567.6
Depreciation expense:			
CCS	\$53.4	\$58.5	\$54.2
CMS	22.2	23.2	26.3
Consolidated depreciation expense	\$75.6	\$81.7	\$80.5
Additions to property, plant and equipment:			
CCS	\$59.4	\$45.0	\$49.6
CMS	22.9	23.7	18.7
Consolidated additions to property, plant and equipment	\$82.3	\$68.7	\$68.3

Customer Information

Net sales to Anixter International Inc. and its affiliates (Anixter) accounted for 11% of the Company's total net sales during each of the years ended December 31, 2018, 2017 and 2016. Sales to Anixter primarily originate within the CCS segment. Other than Anixter, no direct customer accounted for 10% or more of the Company's total net sales for

any of the above periods.

No direct customer accounted for 10% or more of the Company's accounts receivable as of December 31, 2018. Accounts receivable from Anixter represented approximately 12% of accounts receivable as of December 31, 2017. Other than Anixter, no direct customer accounted for 10% or more of the Company's accounts receivable as of December 31, 2017.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

Related Party Transactions

There were no material related party transactions for the years ended December 31, 2018, 2017 or 2016.

Geographic Information

Sales to customers located outside of the U.S. comprised 44%, 46% and 46% of total net sales during the years ended December 31, 2018, 2017 and 2016, respectively. Sales by geographic region, based on the destination of product shipments, were as follows:

	Year Ended December 31,		
	2018	2017	2016
United States	\$2,539.2	\$2,449.4	\$2,634.9
Europe, Middle East and Africa (EMEA)	963.0	942.5	933.5
Asia Pacific (APAC)	735.6	828.3	961.0
Caribbean and Latin America (CALA)	242.9	245.6	280.3
Canada	87.8	94.8	113.9
Consolidated net sales	\$4,568.5	\$4,560.6	\$4,923.6

Long-lived assets, excluding intangible assets, consist substantially of property, plant and equipment. The Company's long-lived assets, excluding intangible assets, located in the U.S., EMEA, APAC and CALA regions represented the following percentages of such long-lived assets: 56%, 18%, 19% and 7%, respectively, as of December 31, 2018 and 52%, 21%, 20%, and 7%, respectively, as of December 31, 2017.

15. SUBSEQUENT EVENTS

On November 8, 2018, the Company announced an agreement to acquire ARRIS International plc (ARRIS) in an all cash transaction with a total purchase price of approximately \$7.4 billion, or \$31.75 per share. To fund the acquisition of ARRIS, on February 19, 2019, the Company issued \$1.25 billion of 5.50% senior secured notes due 2024, \$1.5 billion of 6.00% senior secured notes due 2026 and \$1.0 billion of 8.25% senior unsecured notes due 2027 and priced the borrowing of \$3.2 billion under a new senior secured term loan due 2026 with an interest rate of LIBOR plus 3.25%. The proceeds of the notes were placed into escrow and will be released upon consummation of the acquisition, and it is expected that the new senior secured term loan will be borrowed at closing of the acquisition. The Company expects to use a portion of the new senior secured term loan to pay off its existing senior secured term loan due December 2022. The Company also expects to enter into a new asset-based revolving credit facility in an amount of up to \$1.0 billion, subject to borrowing base capacity.

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CommScope Holding Company, Inc.

Notes to Consolidated Financial Statements-(Continued)

(In thousands, unless otherwise noted)

16. QUARTERLY FINANCIAL DATA (UNAUDITED)

	First	Second	Third	Fourth
	Quarter	Quarter	Quarter	Quarter
	2018	2018	2018	2018
Net sales	\$1,120,517	\$1,239,856	\$1,150,405	\$1,057,729
Gross profit	411,400	471,310	423,874	381,700
Operating income (1)(2)(3)	103,726	164,688	132,225	49,329
Net income (loss) (4)	33,735	65,922	63,843	(23,283)
Basic earnings (loss) per share	\$0.18	\$0.34	\$0.33	\$(0.12)
Diluted earnings (loss) per share	\$0.17	\$0.34	\$0.33	\$(0.12)

	First	Second	Third	Fourth
	Quarter	Quarter	Quarter	Quarter
	2017	2017	2017	2017
Net sales	\$1,137,285	\$1,174,090	\$1,128,775	\$1,120,432
Gross profit	453,807	471,765	428,605	413,627
Operating income (1)(2)	119,972	136,389	125,428	90,250
Net income (4)	33,562	55,464	51,157	53,581
Basic earnings per share	\$0.17	\$0.29	\$0.27	\$0.28
Diluted earnings per share	\$0.17	\$0.28	\$0.26	\$0.27

- (1) Operating income for the first, second, third and fourth quarters in 2018 included charges related to restructuring costs of \$5,450, \$7,218, \$7,070 and \$24,287, respectively. Operating income for the first, second, third and fourth quarters in 2017 included charges related to restructuring costs of \$5,388, \$13,773, \$5,360 and \$19,261, respectively.
- (2) Operating income for the first, second, third and fourth quarters in 2018 included charges related to integration and transaction costs of \$1,614, \$959, \$2,647 and \$14,314, respectively. Operating income for the first, second, third and fourth quarters in 2017 included charges related to integration and transaction costs of \$13,485, \$12,684, \$12,093 and \$9,784, respectively.
- (3) Operating income for the fourth quarter in 2018 included an asset impairment charge of \$15,000.
- (4) Net income (loss) for the fourth quarter in 2018 included employee defined benefit plan termination charges of \$24,818 and foreign currency losses of \$13,952 resulting from an entity liquidation. Net income for the fourth quarter in 2017 included a benefit of \$22,358 for the estimated impact of U.S. tax reform and a benefit of \$16,740 related to tax law changes in certain foreign jurisdictions.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of the Chief Executive Officer (CEO) and Chief Financial Officer (CFO), evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act)) as of the end of the period covered by this report.

Based on this evaluation, our CEO and CFO have concluded that, as of the end of the period covered by this report, these disclosure controls and procedures were effective and operating to provide reasonable assurance that information that we are required to disclose in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission, and that such information is accumulated and communicated to our management, including our CEO and CFO, as appropriate, to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

The management of CommScope is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rule 13a-15(f) and 15d-15(f) under the Exchange Act, 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 consolidated 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 consolidated 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 consolidated financial statements.

CommScope's management assessed the effectiveness of CommScope's internal control over financial reporting as of December 31, 2018. In making this assessment, CommScope's management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control – Integrated Framework (2013). Based on this assessment, management concluded that, as of December 31, 2018, CommScope's internal control over financial reporting is effective based on the COSO internal control criteria.

CommScope's independent registered public accounting firm, Ernst & Young LLP, has issued an attestation report on the effectiveness of CommScope's internal control over financial reporting, which is included herein.

Changes in Internal Control over Financial Reporting

There have been no changes in the Company's internal controls over financial reporting during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Inherent Limitations of Disclosure Controls and Internal Control over Financial Reporting

Because of their inherent limitations, our disclosure controls and procedures and our internal control over financial reporting may not prevent all material errors or fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. The effectiveness of our disclosure controls and procedures and our internal control over financial reporting is subject to risks, including that the controls may become inadequate because of changes in conditions or that the degree of compliance with our policies or procedures may deteriorate.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

Code of Ethics for Principal Executive and Senior Financial and Accounting Officers

We have adopted the CommScope Holding Company, Inc. Code of Ethics for Principal Executive and Senior Financial and Accounting Officers (the Senior Officer Code of Ethics), a code of ethics that applies to our Chief Executive Officer, Chief Financial Officer and Chief Accounting Officer. The Senior Officer Code of Ethics is publicly available on our web site at www.commscope.com. If we make an amendment to, or grant a waiver from, a provision of the Senior Officer Code of Ethics, we will disclose the nature of such waiver or amendment on our web site.

ITEM 11. EXECUTIVE COMPENSATION

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Documents Filed as Part of this Report:

1. Audited Consolidated Financial Statements

The following consolidated financial statements of CommScope Holding Company, Inc. are included under Part II, Item 8:

Reports of Independent Registered Public Accounting Firm

Consolidated Statements of Operations and Comprehensive Income for the Years Ended December 31, 2018, 2017 and 2016

Consolidated Balance Sheets as of December 31, 2018 and 2017

Consolidated Statements of Cash Flows for the Years Ended December 31, 2018, 2017 and 2016

Consolidated Statements of Stockholders' Equity for the Years Ended December 31, 2018, 2017 and 2016

Notes to Consolidated Financial Statements

2. Financial Statement Schedules

All schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

3. List of Exhibits. See Index of Exhibits included herein.

Index of Exhibits

Exhibit No.	Description
* 2.1	<u>Stock and Asset Purchase Agreement, dated January 27, 2015, by and among CommScope Holding Company, Inc., CommScope, Inc. and TE Connectivity Ltd. (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on January 28, 2015).</u>
* 2.2	<u>Bid Conduct Agreement, dated November 8, 2018, among CommScope Holding Company, Inc. and ARRIS International plc (the Bid Conduct Agreement) (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on November 8, 2018).</u>
* 2.3	<u>First Amendment to Bid Conduct Agreement, dated January 2, 2019, between CommScope Holding Company, Inc. and ARRIS International plc (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on January 3, 2019).</u>
* 3.1	<u>Amended and Restated Certificate of Incorporation of CommScope Holding Company, Inc. (Incorporated by reference to Exhibit 3.1 of the Registrant's Form 10-Q (File No. 001-36146), filed with the SEC on November 7, 2013).</u>
* 3.2	<u>Fourth Amended and Restated By-Laws of CommScope Holding Company, Inc. (as adopted December 13, 2016) (Incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on December 14, 2016).</u>
* 4.1	<u>Indenture governing the 5.000% Senior Notes due 2021 by and among CommScope, Inc. as Issuer, the subsidiary guarantors named therein and Wilmington Trust, National Association, as trustee, dated as of May 30, 2014, (including form of 5.000% Senior Note due 2021) (Incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on June 2, 2014).</u>
* 4.2	<u>Indenture governing the 5.500% Senior Notes due 2024 by and among CommScope, Inc. as Issuer, the subsidiary guarantors named therein and Wilmington Trust, National Association, as trustee, dated as of May 30, 2014, (including form of 5.500% Senior Note due 2024) (Incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on June 2, 2014).</u>
* 4.3	<u>Indenture governing the 6.000% Senior Notes due 2025 by and between the CommScope Technologies Finance LLC and Wilmington Trust, National Association, as trustee, dated as of June 11, 2015 (including form of 6.000% Senior Note due 2025) (Incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on June 12, 2015).</u>
* 4.4	<u>First Supplemental Indenture, dated August 28, 2015, by and among CommScope Technologies LLC, the Guarantors party thereto and Wilmington Trust, National Association, as trustee (Incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on August 28, 2015).</u>
* 4.5	<u>Indenture governing the 5.000% Senior Notes due 2027, by and among CommScope Technologies LLC, the guarantors named therein and Wilmington Trust, National Association, as trustee and as collateral agent, dated as of March 13, 2017, (including form of 5.000% Senior Note due 2027) (Incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on March 13, 2017).</u>

- | Exhibit No. | Description |
|-------------|--|
| * 10.1 | <u>Revolving Credit and Guaranty Agreement, dated as of January 14, 2011, by and among Cedar I Holding Company, Inc. (now CommScope Holding Company, Inc.), CommScope, Inc., as Parent Borrower, the U.S. Co-Borrowers and European Co-Borrowers named therein, the guarantors named therein, the Lenders from time to time party thereto, J.P. Morgan Securities LLC, as Lead Arranger and Bookrunner, JPMorgan Chase Bank, N.A., as US Administrative Agent, and J.P. Morgan Europe Limited, as European Administrative Agent and the Senior Managing Agents and Documentation Agents named therein (the Revolving Credit Facility) (Incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.2 | <u>Amendment No. 1 to the Revolving Credit Facility, dated as of March 9, 2012, among CommScope, Inc., as Parent Borrower, the U.S. Borrowers, European Co-Borrowers and Guarantors named therein, the Lenders party thereto, JPMorgan Chase Bank, N.A., as U.S. Administrative Agent, and J.P. Morgan Europe Limited, as European Administrative Agent (Incorporated by reference to Exhibit 10.2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.3 | <u>Amendment No. 2 to the Revolving Credit Facility, dated as of May 21, 2015, among CommScope, Inc., as Parent Borrower, CommScope Holding Company, Inc., as Holdings, the US Co-Borrowers and European Co-Borrowers named therein, the Lenders party thereto, JPMorgan Chase Bank, N.A., as U.S. Administrative Agent, and J.P. Morgan Europe Limited, as European Administrative Agent (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), originally filed with the SEC on May 22, 2015).</u> |
| * 10.4 | <u>Revolving Credit Facility Pledge and Security Agreement, dated as of January 14, 2011, among CommScope, Inc. (as successor by merger to Cedar I Merger Sub, Inc.) and the additional Grantors party thereto, in favor of JPMorgan Chase Bank, N.A., as collateral agent and as administrative agent for the Secured Parties referred to therein (Incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.5 | <u>Patent Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.4 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.6 | <u>Trademark Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.7 | <u>Copyright Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.6 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.8 | <u>Credit Agreement, dated as of January 14, 2011, among CommScope, Inc. (as successor by merger to Cedar I Merger Sub, Inc.), as Borrower, CommScope Holding Company, Inc.(as successor by merger to Cedar I Holding Company, Inc.), the Lenders from time to time party thereto, JPMorgan Chase Bank, N.A. as Administrative Agent and Collateral Agent and J.P. Morgan Securities LLC as Arranger and Sole Bookrunner (Incorporated by reference to Exhibit 10.7 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |

- | Exhibit No. | Description |
|-------------|--|
| * 10.8.1 | <u>Amendment Agreement, dated as of March 7, 2012, among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., the subsidiary guarantors party thereto, the Lenders from time to time party thereto, JPMorgan Chase Bank, N.A. as Administrative Agent and Collateral Agent and J.P. Morgan Securities LLC as Arranger and Sole Bookrunner (Incorporated by reference to Exhibit 10.8 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.8.2 | <u>Amendment Agreement, dated as of March 8, 2013, among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., the subsidiary guarantors party thereto, the Lenders from time to time party thereto, JPMorgan Chase Bank, N.A. as Administrative Agent and Collateral Agent, J.P. Morgan Securities LLC and Deutsche Bank Trust Company Americas, as syndication agent (Incorporated by reference to Exhibit 10.9 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.8.3 | <u>Amendment No. 3, dated as of December 3, 2013, to the Credit Agreement, dated as of January 14, 2011, among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., the subsidiary guarantors named therein, the several banks and other financial institutions or entities from time to time parties thereto as Lenders, JPMorgan Chase Bank, N.A., as administrative agent and collateral agent and the other agents and arrangers party thereto. (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on December 3, 2013).</u> |
| * 10.8.4 | <u>Amendment Agreement, dated as of October 31, 2016, to the Credit Agreement, dated as of January 11, 2011, among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., as Holdings, the several banks and other financial institutions or entities from time to time parties thereto as Lenders, JPMorgan Chase Bank, N.A., as Administrative Agent and the other agents and arrangers party thereto. (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on October 31, 2016).</u> |
| * 10.8.5 | <u>Amendment Agreement, dated as of May 31, 2017, to the Credit Agreement, dated as of January 11, 2011, among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., as Holdings, the several banks and other financial institutions or entities from time to time parties thereto as Lenders, JPMorgan Chase Bank, N.A., as Administrative Agent and the other agents and arrangers party thereto. (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on May 31, 2017).</u> |
| * 10.9 | <u>Term Loan Credit Facility Pledge and Security Agreement, dated as of January 14, 2011, among CommScope, Inc. (as successor by merger to Cedar I Merger Sub, Inc.) and the additional Grantors party thereto, in favor of JPMorgan Chase Bank, N.A., as collateral agent and as administrative agent for the Secured Parties referred to therein (Incorporated by reference to Exhibit 10.10 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.10 | <u>Patent Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.11 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.11 | <u>Trademark Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.12 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u> |
| * 10.12 | <u>Copyright Security Agreement, dated as of January 14, 2011, made by Allen Telecom LLC, Andrew LLC and CommScope, Inc. of North Carolina in favor of JPMorgan Chase Bank, N.A., as Collateral Agent (Incorporated by reference to Exhibit 10.13 to the Registrant's Registration Statement on Form</u> |

Exhibit No.	Description
* 10.13	<u>Holdings Guaranty, dated as of January 14, 2011, by CommScope Holding Company, Inc. in favor of the Secured Parties referred to therein (Incorporated by reference to Exhibit 10.14 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u>
* 10.14	<u>Subsidiary Guaranty, dated as of January 14, 2011, from the Subsidiary Guarantors named therein in favor of the Secured Parties referred to therein (Incorporated by reference to Exhibit 10.15 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u>
* 10.15	<u>Intercreditor Agreement, dated as of January 14, 2011, by and among CommScope Inc., CommScope Holding Company, Inc., certain Subsidiaries party thereto as a Guarantor, JPMorgan Chase Bank, N.A., as administrative agent and collateral agent for the holders of Revolving Credit Obligations, and JPMorgan Chase Bank, N.A., as administrative agent and collateral agent for the holders of Initial Fixed Asset Obligations (Incorporated by reference to Exhibit 10.16 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), originally filed with the SEC on August 2, 2013).</u>
* 10.16	<u>Incremental Joinder Agreement, dated August 28, 2015, by and among CommScope, Inc., as Borrower, CommScope Holding Company, Inc., as Holdings, the Subsidiary Guarantors party thereto, the lenders party thereto, JPMorgan Chase Bank, N.A. as Administrative Agent and Collateral Agent, and JPMorgan Chase Bank, N.A., as Escrow Administrative Agent (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on August 28, 2015).</u>
* 10.17	<u>Notes Pledge and Security Agreement, dated as of June 11, 2015, among CommScope, Inc., as a Grantor and the additional Grantors party thereto, in favor of Wilmington Trust, National Association, as collateral agent under the Indenture referred to therein (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on June 12, 2015).</u>
* 10.18	<u>Amended and Restated Employment Agreement between Frank M. Drendel and CommScope, Inc., dated January 14, 2011, as amended on September 12, 2013 (Incorporated by reference to Exhibit 10.18 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013).</u>
* 10.19	<u>Employment Agreement between Marvin S. Edwards, Jr. and CommScope, Inc., dated January 14, 2011, as amended on September 12, 2013 (Incorporated by reference to Exhibit 10.20 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.20	<u>Employment Agreement between Mark A. Olson and CommScope, Inc., dated January 21, 2014 (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on January 23, 2014). ***</u>
* 10.21	<u>Form of Amended and Restated Severance Protection Agreement between CommScope, Inc. and certain executive officers entered into prior to 2013 (Incorporated by reference to Exhibit 10.21 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.22	<u>Form of Amendment, effective June 3, 2016, to Severance Protection Agreement between CommScope, Inc. and certain executive officers entered into prior to 2013 (Incorporated by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on July 28, 2016). ***</u>
** 10.23	<u>Form of Amended and Restated Severance Protection Agreement between CommScope, Inc. and certain executive officers entered into after 2015. ***</u>

Exhibit No.	Description
* 10.24	<u>Form of Indemnification Agreement (Incorporated by reference to Exhibit 10.22 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.25	<u>Amended and Restated CommScope, Inc. 2006 Long Term Incentive Plan (as amended and restated effective February 28, 2007) (Incorporated by reference to Exhibit 10.25 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.26	<u>Amended and Restated CommScope Holding Company, Inc. 2011 Incentive Plan (as amended and restated effective February 19, 2013) (Incorporated by reference to Exhibit 10.26 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.27	<u>Forms of Nonqualified Stock Option Certificate under the Amended and Restated CommScope Holding Company, Inc. 2011 Incentive Plan (Incorporated by reference to Exhibit 10.31 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.28	<u>CommScope Holding Company, Inc. Amended and Restated 2013 Long-Term Incentive Plan (as amended and restated effective February 21, 2017) (Incorporated by reference to Exhibit 10.28 of the Registrant's Annual Report on Form 10-K (File No. 001-36146), filed with the SEC on February 23, 2017). ***</u>
* 10.29	<u>Form of Restricted Stock Unit Award Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 30, 2015). ***</u>
* 10.30	<u>Form of Performance Share Unit Award Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.3 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 30, 2015). ***</u>
* 10.31	<u>Form of Non-Qualified Stock Option Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.4 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 30, 2015). ***</u>
* 10.32	<u>CommScope Holding Company, Inc. Amendment to Outstanding Options, effective March 7, 2016 (Incorporated by reference to Exhibit 10.5 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 28, 2016). ***</u>
* 10.33	<u>Form of Restricted Stock Unit Award Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (for grants in 2016 and later) (Incorporated by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 28, 2016). ***</u>
* 10.34	<u>Form of Performance Share Unit Award Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (for grants in 2016 and later) (Incorporated by reference to Exhibit 10.3 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 28, 2016). ***</u>
* 10.35	<u>Form of Non-Qualified Stock Option Certificate under the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (for grants in 2016 and later) (Incorporated by reference to Exhibit 10.4 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 28, 2016). ***</u>
* 10.36	<u>CommScope Holding Company, Inc. Annual Incentive Plan, as amended February 17, 2016 (Incorporated by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on April 28, 2016). ***</u>

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Exhibit No.	Description
* 10.37	<u>Amended and Restated CommScope, Inc. Supplemental Executive Retirement Plan (as amended and restated effective April 9, 2009) (Incorporated by reference to Exhibit 10.30 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.38	<u>First Amendment, dated January 12, 2011, to Amended and Restated CommScope, Inc. Supplemental Executive Retirement Plan (Incorporated by reference to Exhibit 10.32 of Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-190354), filed with the SEC on September 12, 2013). ***</u>
* 10.39	<u>CommScope Holding Company, Inc. Non-Employee Director Compensation Plan, as amended on November 28, 2017 (Incorporated by reference to Exhibit 10.39 of the Registrant's Annual Report on Form 10-K (File No. 001-36146), filed with the SEC on February 15, 2018).</u>
* 10.40	<u>Form of Restricted Stock Unit Award Certificate under the CommScope Holding Company, Inc. Non-Employee Director Compensation Plan, which is operated as a subplan of the CommScope Holding Company, Inc. 2013 Long-Term Incentive Plan (Incorporated by reference to Exhibit 10.34 of the Registrant's Annual Report on Form 10-K (File No. 001-36146), filed with the SEC on February 20, 2014).</u>
* 10.41	<u>CommScope Holding Company, Inc. Deferred Compensation Plan (as amended and restated effective January 1, 2017) (Incorporated by reference to Exhibit 10.41 of the Registrant's Annual Report on Form 10-K (File No. 001-36146), filed with the SEC on February 23, 2017). ***</u>
* 10.42	<u>Investment Agreement, dated November 8, 2018, by and between CommScope Holding Company, Inc. and Carlyle Partners VII S1 Holdings, L.P. (Incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on November 8, 2018).</u>
* 10.43	<u>Commitment Letter, dated November 8, 2018, by and among CommScope Holding Company, Inc., CommScope, Inc., JPMorgan Chase Bank, N.A., Bank of America, N.A., Merrill Lynch, Pierce, Fenner & Smith Incorporated, Deutsche Bank AG New York Branch, Deutsche Bank AG Cayman Islands Branch and Deutsche Bank Securities Inc. (Incorporated by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K (File No. 001-36146), filed with the SEC on November 8, 2018).</u>
* 18.1	<u>Preferability Letter from Ernst & Young LLP, Independent Registered Public Accounting Firm (Incorporated by Reference to Exhibit 18.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-36146), filed with the SEC on May 4, 2017).</u>
** 21.1	<u>List of Subsidiaries</u>
** 23.1	<u>Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm</u>
** 31.1	<u>Certification of Principal Executive Officer pursuant to Rule 13a-14(a).</u>
** 31.2	<u>Certification of Principal Financial Officer pursuant to Rule 13a-14(a).</u>
± 32.1	<u>Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350 as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished pursuant to Item 601(b)(32)(ii) of Regulation S-K).</u>
† 101.INS	XBRL Instance Document, furnished herewith
† 101.SCH	XBRL Schema Document, furnished herewith
† 101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document

- † 101.DEF XBRL Taxonomy Extension Definition Linkbase Document
 - † 101.LAB XBRL Taxonomy Extension Label Linkbase Document
 - † 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document
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Exhibit No. Description

*Previously filed

**Filed herewith

*** Management contract or compensatory plan or arrangement.

In accordance with Rule 406T of Regulation S-T, the information in these exhibits is furnished and deemed not filed or part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, is deemed not filed for purposes of Section 18 of the Exchange Act of 1934, and otherwise is not subject to liability under these sections.

±In accordance with Item 601(b)(32)(ii) of Regulation S-K and SEC Release No. 33-8238 and 34-47986, Final Rule: Management's Reports on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, the certification furnished in Exhibit 32.1 hereto is deemed to accompany this Form 10-K and will not be deemed "filed" for purposes of Section 18 of the Exchange Act. Such certification will not be deemed to be incorporated by reference into any filings under the Securities Act or the Exchange Act, except to the extent that the registrant specifically incorporates it by reference.

SIGNATURES

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

COMMSCOPE
HOLDING
COMPANY,
INC

BY: /s/
MARVIN
S.

DATE: February 20, 2019 EDWARDS,
JR.

Marvin
S.
Edwards,
Jr.
President and
Chief Executive
Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ MARVIN S. EDWARDS, JR. Marvin S. Edwards, Jr.	President, Chief Executive Officer and Director (Principal Executive Officer)	February 20, 2019
/s/ ALEXANDER W. PEASE Alexander W. Pease	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 20, 2019
/s/ BROOKE B. CLARK Brooke B. Clark	Senior Vice President and Chief Accounting Officer (Principal Accounting Officer)	February 20, 2019
/s/ FRANK M. DRENDEL Frank M. Drendel	Director and Chairman of the Board	February 20, 2019

/s/ AUSTIN A. ADAMS Austin A. Adams	Director	February 20, 2019
/s/ STEPHEN C. GRAY Stephen C. Gray	Director	February 20, 2019
/s/ L. WILLIAM KRAUSE L. William Krause	Director	February 20, 2019
/s/ JOANNE M. MAGUIRE Joanne M. Maguire	Director	February 20, 2019
/s/ THOMAS J. MANNING Thomas J. Manning	Director	February 20, 2019
/s/ CLAUDIUS E. WATTS IV Claudius E. Watts IV	Director	February 20, 2019
/s/ TIMOTHY T. YATES Timothy T. Yates	Director	February 20, 2019