NN INC
Form 10-K
March 18, 2019
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2018
OR
TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission file number 000-23486

NN, Inc.
(Exact name of registrant as specified in its charter)

Delaware	62-1096725
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)
6210 Ardrey Kell Road Charlotte, North Carolina	28277
(Address of principal executive offices)	(Zip Code)

(980) 264-4300
(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, par value $0.01	The Nasdaq Stock Market LLC

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

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Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes   No þ
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 þ
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes þ No

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 file). Yes þ 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 definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes   No þ
The aggregate market value of the voting and non-voting common stock held by non-affiliates of the registrant was approximately $247 million as of June 30, 2018, the last business day of the registrant's most recently completed second fiscal quarter, computed using the closing price of the registrant's common stock as quoted on the Nasdaq Stock Market LLC on that date of $18.90. Solely for purposes of making this calculation, shares of the registrant's common stock held by named executive officers, directors and 5% or greater stockholders of the registrant as of such date have been excluded because such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for any other purposes.
As of March 8, 2019, there were 42,104,207 shares of the registrant's common stock, par value $0.01 per share, outstanding.
DOCUMENTS INCORPORATED BY REFERENCE
Portions of the Proxy Statement with respect to the 2019 Annual Meeting of Stockholders are incorporated by reference in Part III, Items 10 to 14 of this Annual Report on Form 10-K as indicated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2018.

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PART I

Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements that are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements may discuss goals, intentions and expectations as to future trends, plans, events, results of operations or financial condition, or state other information relating to NN, Inc., based on current beliefs of management as well as assumptions made by, and information currently available to, management. Forward-looking statements generally will be accompanied by words such as "anticipate," "believe," "could," "estimate," "expect," "forecast," "guidance," "intend," "may," "possible," "potential," "predic
other similar words, phrases or expressions. Forward-looking statements involve a number of risks and uncertainties that are outside of management's control and that may cause actual results to be materially different from such forward-looking statements. Such factors include, among others, general economic conditions and economic conditions in the industrial sector, competitive influences, risks that current customers will commence or increase captive production, risks of capacity underutilization, quality issues, availability of raw materials, currency and other risks associated with international trade, our dependence on certain major customers, the impact of acquisitions and divestitures, unanticipated difficulties integrating acquisitions and realizing anticipated cost savings and operating efficiencies, risks associated with joint ventures, new laws and governmental regulations, and other risk factors and cautionary statements listed from time to time in our periodic reports filed with the Securities and Exchange Commission. We disclaim any obligation to update any such factors or to publicly announce the result of any revisions to any of the forward-looking statements included herein or therein to reflect future events or developments.

Except for per share data or as otherwise noted, all dollar amounts presented in tables that follow are in thousands of U.S. dollars.

Item 1. Business

Introduction

We are a global diversified industrial company that combines advanced engineering and production capabilities with in-depth materials science expertise to design and manufacture high-precision solutions, components and assemblies for the medical, aerospace and defense, electrical, automotive and general industrial markets. We have 51 facilities in North America, Europe, South America and China.

In January 2018, we implemented a new enterprise and management structure designed to accelerate growth and further balance our portfolio by aligning our strategic assets and businesses. Our businesses were reorganized into the Mobile Solutions, Power Solutions and Life Sciences groups and are based principally on the end markets they serve. The Autocam Precision Components Group reported in our historical financial statements was renamed as Mobile Solutions. Mobile Solutions is focused on growth in the general industrial and automotive end markets. The Precision Engineered Products Group reported in our historical financial statements was bifurcated into two new groups – Power Solutions and Life Sciences. Power Solutions is focused on growth in the electrical and aerospace and defense end markets. Life Sciences is focused on growth in the medical end market. In the first quarter of 2018, we began reporting our financial results based on these new reportable segments. Prior year amounts have been revised to conform to the current year presentation.

Our business as conducted in 2018, products, and recent acquisition activity are described further below.

Acquisition Activity

Paragon Medical Acquisition

On May 7, 2018, we acquired 100% of the stock of PMG Intermediate Holding Corporation, the parent company of Paragon Medical, Inc. ("Paragon Medical") for a base purchase price of $375.0 million in cash, subject to certain adjustments. After working capital and other closing adjustments, the cash purchase price was approximately $390.9 million which included $13.6 million in cash acquired. Paragon Medical is a medical device manufacturer which focuses on the orthopedic, case and tray, implant and instrument markets. This acquisition continues our strategic focus to expand our Life Sciences portfolio as well as create a balanced business by diversifying our products and finished device offerings. Operating results of Paragon Medical are reported prospectively from the date of acquisition in our Life Sciences group.

Other Acquisitions

On February 22, 2018, we completed the acquisition of 100% of the assets of Bridgemedica, LLC (“Bridgemedica”) for $15.0 million in cash. For accounting purposes, Bridgemedica meets the definition of a business and has been accounted for as a

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business combination. Bridgemedica is a medical device company that provides concept to supply solutions through design, development engineering and manufacturing. Operating results of Bridgemedica are reported prospectively in our Life Sciences group after the acquisition date.

On August 9, 2018, we completed the acquisition of 100% of the capital stock of Southern California Technical Arts, Inc. ("Technical Arts"). For accounting purposes, Technical Arts meets the definition of a business and has been accounted for as a business combination. Technical Arts is an industrial machining company that manufactures tight tolerance metal components and assemblies. The acquisition of Technical Arts expands the NN presence in the aerospace and defense end market. Operating results of Technical Arts are reported prospectively in our Power Solutions group after the acquisition date.

Business Segments and Products

Mobile Solutions

Mobile Solutions is focused on growth in the general industrial and automotive end markets. We manufacture a wide range of highly engineered, difficult to manufacture, precision metal components and sub-assemblies for the automotive and general industrial end markets. We have developed an expertise in manufacturing highly complex, system critical components for fuel systems, engines and transmissions, power steering systems and electromechanical motors on a high-volume basis. This expertise has been gained through investment in technical capabilities, processes and systems, and skilled program management and product launch capabilities.

Power Solutions

Power Solutions is focused on growth in the electrical and aerospace and defense end markets. Within this group we combine materials science expertise with advanced engineering and production capabilities to design and manufacture a broad range of high-precision metal and plastic components, assemblies, and finished devices used in applications ranging from power control to flight control and for military devices.

We manufacture a variety of products including electrical contacts, connectors, contact assemblies and precision stampings for the electrical end market and high precision products for the aerospace and defense end markets utilizing our extensive process technologies for optical grade plastics, thermally conductive plastics, titanium, Inconel, magnesium, and electroplating.

Life Sciences

Life Sciences is focused on growth in the medical end market. Within this group we combine advanced engineering and production capabilities to design and manufacture a broad range of high-precision metal and plastic components, assemblies, and finished devices.

We manufacture a variety of components, assemblies, and instruments, such as surgical knives, bioresorbable implants, surgical staples, cases and trays, orthopedic implants and tools, laparoscopic devices, and drug delivery devices for the medical and life sciences end market.

Competitive Strengths

High-precision manufacturing capabilities

We believe our ability to produce high-precision parts at high production volumes is among the best in the market. Our technology platform consists of high precision machining, progressive stamping, injection molding, laser welding, material science, assembly, and design optimization. Unique specialty machine building capabilities, in-house tool design and process know-how create trade secrets that enable consistent production tolerances of less than one micron while producing millions of parts per day. Parts are manufactured to application-specific customer design and co-design standards that are developed for a specific use. The high-precision capabilities are part of our zero-defect design process which seeks to eliminate variability and manufacturing defects throughout the entire product lifecycle. We believe our production capabilities provide a competitive advantage as few other manufacturers are capable of meeting tolerance demands at any volume level requested by our customers. As the need for tight-tolerance precision parts, subassemblies, and devices continues to increase, we believe that our production capabilities will place us at the forefront of the industry. We have differentiated ourselves among our competitors by providing customers engineered solutions and a broad reach and breadth of manufacturing capabilities. We believe it is for these reasons, and because of our proven ability to produce high-quality, precision parts and components on a cost-effective basis, that customers choose us to meet their manufacturing needs.

Differentiated, system-critical products

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The tight-tolerance and high-quality nature of our precision products is specifically suited for use in the most demanding applications that require superior reliability. Our products are critical components to the operation and reliability of larger mechanical systems. Precision parts are difficult to manufacture and achieve premium pricing in the marketplace as the high cost of failure motivates our customers to focus on quality. Our products are developed for specific uses within critical systems and are typically designed in conjunction with the system designer. Our parts are often qualified for, or specified in, customer designs, reducing the ability for customers to change suppliers.

Our ability to make products with tight-tolerance and extreme precision requirements enables our customers to satisfy the critical functionality and performance requirements of their products. We are included in customer designs and deployed in critical systems that involve high cost of failure applications and significant regulatory certification processes, including those for the Food and Drug Administration ("FDA"), Underwriters Laboratories ("UL") and the National Aerospace and Defense Contractors Accreditation Program ("NADCAP").

Complete product lifecycle focus

Our engineering expertise and deep knowledge of precision manufacturing processes adds proprietary value throughout the complete lifecycle of our products. Our in-house engineering team works closely with our customers to provide parts that meet specific design specifications for a given application. The relationship with the customer begins early in the conceptual design process when we provide feedback on potential cost, manufacturability and estimated reliability of the parts. Part designs are then prototyped, tested and qualified in coordination with the customer design process before going to full-scale production. The close working relationship with our customers early in the product lifecycle helps to secure business, increase industry knowledge, and develop significant trade secrets. Performance verification, product troubleshooting and post-production engineering services further deepen relationships with our customers as well as provide additional industry knowledge that is applicable to future design programs and provide continuous manufacturing process improvement.

Prototype products are developed for testing, and process validation procedures are instituted. In many instances, we will file for regulatory production approval and include the customer's proprietary processes, further discouraging supplier changes. We will assist the customer with continuous supply chain management and comprehensive customer support for the lifetime of the product and continuously seek to identify new operational efficiencies to reduce the product's cost and improve its quality. Once our solution is designed into a platform, it is often embedded through the multi-year manufacturing lifecycle and has a competitive advantage in supporting subsequent platforms. As an added benefit, customers generally fund development, prototypes and manufacturing tooling expenses. This discourages supplier changes and drives recurring revenue for us.

Long-term blue-chip customer base

We maintain relationships with hundreds of customers around the world. Our customers are typically sophisticated, engineering-driven, mechanical systems manufacturers with long histories of product development and reputations for quality. We have no significant retail exposure, which limits volatility and provides enhanced sales visibility. Relationships with our top ten customers, in terms of revenue, average more than ten years. We have significant exposure to emerging markets in Asia, South America and Eastern Europe through these global customers as well as key local manufacturers. The diverse nature, size and reach of our customer base provides resistance to localized market and geographic fluctuations and help stabilizes overall product demand.

Strategic global footprint

Our 51 facilities, on four continents, are strategically located to serve our customer base and provide local service and expertise. Our global footprint provides flexibility to locally supply identical products for global customers, reducing shipping time and expense, allowing us to match costs to revenue and to capitalize on industry localization trends. In total, we operate more than 2.7 million square feet of manufacturing space. North America constitutes the largest portion of our manufacturing operations with facilities in the U.S. and Mexico. The North American facilities are strategically located to serve major customers in the United States and Mexico. Our foreign facilities are located in regional manufacturing hubs in France, Poland, China, and Brazil, and primarily serve global customers in those local markets. The Asian and South American facilities, we believe, have significant growth potential as local customer bases expand and the markets for high-precision products grow in those regions.

Proven and experienced management team

Our management team has significant experience in precision manufacturing and the diversified industrial sector. Rich Holder was named Chief Executive Officer and director in 2013. Mr. Holder joined us from Eaton Corporation, where he served as President of Eaton Electrical Components Group, and brings to us a proven record of leadership, successful team building and relevant experience in both organic and acquisition growth. He has since assembled a strong management team through

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retention of key talent, recent acquisitions, and new hires. Our management team has successfully executed and integrated into our business nine acquisitions over the last five years, increasing revenue by more than 150% since 2013. We believe that our current management team has the necessary talent and experience to lead our efforts with respect to our organic and acquisition growth goals.

Research and Development and Product Engineering

Our research and development and product engineering efforts focus on enhancing our existing products and developing patented products, particularly in the medical industry, that can be presented to and sold by our customers. Our Life Sciences business has developed a portfolio of patented and branded medical products that we manufacture for customers and that are sold through their channels. Our engineering teams focus on working closely with our customers to develop engineered solutions to improve our customers' products.

Customers

Our products are supplied primarily to manufacturers for use in a broad range of industrial applications, including automotive; electrical; agricultural; construction; residential devices and equipment; medical; aerospace and defense; heating, ventilation, and air conditioning; fluid power and diesel engines. Sales to each of our top ten customers are made to multiple customer locations and divisions throughout the world. In 2018, our top ten customers accounted for approximately 49% of our net sales. In 2018, 77% of our products were sold to customers in North America, 9% to customers in Europe, 9% customers in Asia, and the remaining 5% to customers in South America. We did not have any customer that accounted for 10% or more of total net sales.

We sell our products to most of our largest customers under either sales contracts or agreed upon commercial terms. In general, we pass through material cost fluctuations when incurred to our customers in the form of changes in selling prices. We ordinarily ship our products directly to customers within 60 days, and in many cases, during the same calendar month of the date on which a sales order is placed.

Sales and Marketing

A primary emphasis of our marketing strategy is to expand key customer relationships by offering high quality, high-precision, application-specific customer solutions with the value of a single supply chain partner for a wide variety of products and components. Due to the technical nature of many of our products, our engineers and manufacturing management personnel also provide technical sales support functions, while internal sales employees handle customer orders and other general sales support activities. Our marketing strategy is to offer custom manufactured, high quality, precision products to markets with high value-added characteristics at competitive price levels. This strategy focuses on relationships with key customers that require the production of technically difficult parts and assemblies, enabling us to take advantage of our strengths in custom product development, equipment and tool design, component assembly and machining processes.

Employees

As of December 31, 2018, we employed a total of 5,479 full and part-time employees and 512 temporary workers. Of our total employment, 20% are management employees and 80% are production employees. The employees of the France, Brazil, and Brainin de Mexico plants are unionized. A small group of employees at our Bridgeport, Connecticut, plant is also unionized. We believe we have a good working relationship with our employees and the unions that represent them.

Competition

Mobile Solutions

In the market in which Mobile Solutions operates, internal production of components by our customers can impact our business as the customers weigh the risk of outsourcing strategically critical components or producing in-house. Our primary outside competitors are Anton Häring KG, A. Berger Holding Gmbh & Co. KG, C&A Tool Engineering, Inc., American Turned Products, Inc., Camcraft, Inc., IMS Gear, and Brovedani. We believe that we generally win new business on the basis of technical competence and our proven track record of successful product development.

Power Solutions

Power Solutions operates in intensely competitive but very fragmented supply chains. We must compete with numerous companies in each industry market segment. Our primary competitors in the electrical market are

Deringer-Ney, Inc., Doduco GmbH and Metalor Technologies International. Our primary competitors in the aerospace and defense market are Interplex

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Industries, Inc. and Accu-Mold, LLC. We believe that competition within the electrical and aerospace and defense end markets is based principally on quality, price, design capabilities and speed of responsiveness and delivery. We believe that our competitive strengths are product development, tool design, fabrication, tight tolerance processes, and customer solutions. With these strengths, we have built our reputation in the marketplace as a quality producer of technically difficult products.

Life Sciences

Life Sciences operates in intensely competitive but very fragmented supply chains. Our primary competitors in the medical device market are Tecomet, Inc., Lake Region Medical, Inc. and Vention Medical, Inc. . We compete against other companies depending on the type of product offered or the geographic area served as well as our customers with in-house manufacturing capabilities. Customers will choose manufacturers based on reputation, quality, delivery, responsiveness, breadth of capabilities, including design and engineering support, price, and relationships. We believe that our ability to assist customers through all phases of the product life cycle differentiates us from most of our competitors.

Raw Materials

Mobile Solutions

Mobile Solutions produces products from a wide variety of metals in various forms from various sources located in the North America, Europe, South America and Asia. Basic types include hot rolled steel, cold rolled steel (both carbon and alloy), stainless, extruded aluminum, die cast aluminum, gray and ductile iron castings, hot and cold forgings and mechanical tubing. Some material is purchased directly under contracts, some is consigned by the customer, and some is purchased directly from the steel mills.

Power Solutions

Power Solutions uses a wide variety of metals in various forms, including precious metals like gold, silver, palladium and platinum, as well as plastics. Through our diverse network of suppliers, we minimize supplier concentration risk and provide a stable supply of raw materials at competitive pricing. This group also procures resins and metal stampings from several domestic and foreign suppliers.

Power Solutions bases purchase decisions on quality, service and price. Generally, we do not enter into written supply contracts with our suppliers or commit to maintain minimum monthly purchases of materials. However, we carefully manage raw material price volatility, particularly with respect to precious metals, through the use of consignment agreements. In effect, we contract the precious metals for our own stock and buy the raw materials on the same day customer shipments are priced, thereby eliminating speculation.

Life Sciences

Due to the technically challenging requirements of our customers products, we purchase our raw materials from a limited number of suppliers. Many of the raw materials that are used in our products are subject to fluctuations in market price, particularly titanium and precious metals such as platinum. Generally, raw material prices are passed through to our customers to offset market fluctuations. Because of the lengthy process required to qualify raw materials with our customers, we cannot change suppliers easily. However, we have not experienced any significant interruptions or delays in obtaining critical raw materials.

In each of our segments, we have historically been affected by upward price pressure on steel principally due to general increases in global demand. In general, we pass through material cost fluctuations to our customers in the form of changes in selling price.

Patents, Trademarks and Licenses

We have several U.S. patents, patent applications and trademarks for various trade names. Furthermore, we intend to develop patented products that can be presented to and sold by our customers. However, we cannot be certain that we would be able to protect and enforce our intellectual property rights against third parties, and if we cannot do so, we may face increased competition and diminished net sales.

Furthermore, third parties may assert infringement claims against us based on their patents or other intellectual property, and we may have to pay substantial damages and/or redesign our products if we are ultimately found to infringe. Even if such

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intellectual property claims against us are without merit, investigating and defending these types of lawsuits takes significant time, may be expensive and may divert management attention from other business concerns.
Additionally, we rely on certain data and processes, including trade secrets and know-how, and the success of our business depends, to some extent, on such information remaining confidential. Each officer is subject to a non-competition and confidentiality agreement that seeks to protect this information. Additionally, all employees are subject to company code of ethics policies that prohibit the disclosure of information critical to the operations of our business.

Seasonal Nature of Business

General economic conditions impact our business and financial results, and certain businesses experience seasonal and other trends related to the industries and end markets that they serve. For example, European sales are often weaker in the summer months as customers slow production, medical device sales are often stronger in the fourth calendar quarter, and sales to original equipment manufacturers are often stronger immediately preceding and following the launch of new products. However, as a whole, we are not materially impacted by seasonality.

Environmental Compliance

Our operations and products are subject to extensive federal, state and local regulatory requirements both domestically and abroad relating to pollution control and protection of the environment. These laws and regulations govern, among other things, discharges to air or water, the generation, storage, handling, and use of automotive hazardous materials and the handling and disposal of hazardous waste generated at our facilities. Under such laws and regulations, we are required to obtain permits from governmental authorities for some of our operations. If we violate or fail to comply with these laws, regulations or permits, we could be fined or otherwise sanctioned by regulators. Under some environmental laws and regulations, we could also be held responsible for all the costs relating to any contamination at our past or present facilities and at third-party waste disposal sites. We maintain a compliance program to assist in preventing and, if necessary, correcting environmental problems.
Based on information compiled to date, management believes that our current operations are in substantial compliance with applicable environmental laws and regulations, the violation of which could have a material adverse effect on our business and financial condition. We have assessed conditional asset retirement obligations and have found them to be immaterial to our consolidated financial statements. We cannot assure that currently unknown matters, new laws and regulations, or stricter interpretations of existing laws and regulations will not materially affect our business or operations in the future. More specifically, although we believe that we dispose of waste in material compliance with applicable environmental laws and regulations, we cannot be certain that we will not incur significant liabilities in the future in connection with the clean-up of waste disposal sites.

FDA Compliance

As a manufacturer of medical devices, certain of our subsidiaries and facilities are required to register as such with the FDA. To maintain our registration, we deploy a robust quality management system across all of our manufacturing facilities.
With respect to medical and life sciences products that we are specifically developing to sell to our customers, before these devices can be marketed, we will seek to obtain a marketing clearance from the FDA under Section 510(k) of the United States Federal Food, Drug, and Cosmetic Act. The FDA typically grants a 510(k) clearance if the applicant can establish that the device is substantially equivalent to a predicate device. Clearance under Section 510(k) typically takes about four months from the date of submission.

Executive Officers of the Registrant

Our executive officers are:

Name	Age	Position
Richard D. Holder	56	President and Chief Executive Officer
Thomas C. Burwell, Jr.	50	Senior Vice President – Chief Financial Officer
Matthew S. Heiter	58	Senior Vice President and General Counsel
D. Gail Nixon	48	Senior Vice President and Chief Human Resources Officer
Warren A. Veltman	57	Executive Vice President – Mobile Solutions

J. Robert Atkinson	38	Executive Vice President – Life Sciences
Christopher J. Qualters	51	Executive Vice President – Power Solutions

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Richard D. Holder joined us as President and Chief Executive Officer in June 2013. Prior to joining us, Mr. Holder served as President of Eaton Electrical Components Group of Eaton Corporation's Electrical Sector from 2010 to 2013, Executive Vice President of the Eaton Business Systems from 2007 to 2010, Vice President and General Manager of the Power Distribution and Assemblies Division from 2004 to 2006, and Vice President Supply Chain and Operational Excellence from 2001 to 2004. Prior to joining Eaton, Mr. Holder served as Director of Aircraft & Technical Purchasing for US Airways from 1999 to 2001. Prior to this position, Mr. Holder held a variety of leadership positions at Allied Signal Corporation, an aerospace, automotive and engineering company, and Parker Hannifin Corporation, a global motion and control technology manufacturer. Mr. Holder serves on the board of directors of Actuant Corporation, a publicly held diversified industrial company.

Thomas C. Burwell, Jr. joined us as Corporate Controller in September 2005. He was promoted to Vice President Chief Accounting Officer and Corporate Controller in 2011, and to Senior Vice President and Chief Financial Officer in November 2016. Prior to joining us, Mr. Burwell held various positions at Coats, PLC from 1997 to 2005 ultimately becoming the Vice President of Finance for the U.S. Industrial Division. From 1992 to 1997, Mr. Burwell held various positions at the international accounting firm BDO Seidman, LLP. Mr. Burwell is a Certified Public Accountant.

Matthew S. Heiter joined us as Senior Vice President and General Counsel in July 2015. Prior to joining us, Mr. Heiter was a shareholder in the law firm of Baker, Donelson, Bearman, Caldwell and Berkowitz, PC from May 1996 to December 1999 and from July 2002 to July 2015, where he served as chairman of the firm's Securities and Corporate Governance Practice Group. From January 2000 to July 2002, Mr. Heiter served as the Executive Vice President, General Counsel and Secretary of Internet Pictures Corporation, a publicly traded internet technology company.

D. Gail Nixon joined us in 2007 and was appointed Senior Vice President and Chief Human Resources Officer in January 2018. She previously served as our Vice President of Human Resources as well as Corporate Human Resources Manager. Ms. Nixon is a member of the Society for Human Resource Management and World at Work and has earned her Senior Professional in Human Resources designation. From 2000-2007, she held various accounting and human resources positions with a multi-state healthcare organization, ultimately serving as its corporate human resources director.

Warren A. Veltman joined us as Senior Vice President and General Manager of our former Autocam Precision Components Group in September 2014. Mr. Veltman served as Chief Financial Officer of Autocam Corporation from 1990 and Secretary and Treasurer since 1991. In January 2018, Mr. Veltman was appointed Executive Vice President of our Mobile Solutions business. Prior to Mr. Veltman's service at Autocam, Mr. Veltman was an Audit Manager with Deloitte & Touche LLP.

J. Robert Atkinson was appointed Executive Vice President of our Life Sciences group in January 2018. Mr. Atkinson joined us as Vice President, Corporate Treasurer and Manager of Investor Relations in April 2014 and served as our Vice President, Strategy & Investor Relations from April 2017 to December 2017. Prior to joining us, Mr. Atkinson was with Regions Bank where he served as vice president and commercial relationship manager in Regions Corporate Bank Group, where he was responsible for marquee corporate relationships, developing treasury management solutions, and negotiating terms and conditions for new and renewal credit facilities. Prior to that position, he served as Vice President of business services. Mr. Atkinson also served as a project coordinator for the Electrical Group of Eaton Corporation. Mr. Atkinson is a member of the Association of Financial Professions and earned his certified treasury professional designation.

Christopher J. Qualters was appointed Executive Vice President of the Power Solutions group in January 2018, and previously served as our Vice President and Chief Commercial Officer. Mr. Qualters joined us as part of the Autocam acquisition in 2014, where he served as Vice President of sales and marketing. Prior to joining Autocam in 2008, he held several leadership positions in sales, marketing and product management at Robert Bosch. From 1990 to 2000, Mr. Qualters held the position of sales engineer at The Torrington Company, where he was responsible for anti-friction bearing solutions for the general industrial and automotive industries.

Item 1A. Risk Factors

The following are risk factors that affect our business, prospects, financial condition, results of operations, and cash flows, some of which are beyond our control. These risk factors should be considered in connection with evaluating the forward-looking statements contained in this Annual Report on Form 10-K. If any of the events described below were to actually occur, our business, prospects, financial condition, results of operations, or cash flows could be adversely affected, and results could differ materially from expected and historical results.

Risks Related to Our Operations

We depend heavily on a relatively limited number of customers, and the loss of any major customer would have a material adverse effect on our business.

During 2018, sales to various U.S. and foreign divisions of our ten largest customers accounted for approximately 49% of our consolidated net sales. The loss of all or a substantial portion of sales to these customers would cause us to lose a substantial portion of our revenue and would lower our operating profit margin and cash flows from operations.

Work stoppages or similar difficulties could significantly disrupt our operations, reduce our revenues and materially affect our earnings.

A work stoppage at one or more of our facilities could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows. Also, if one or more of our customers were to experience a work stoppage, that customer would likely halt or limit purchases of our products, which could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

We operate in and sell products to customers outside the U.S. and are subject to several risks related to doing business internationally.

We obtain a majority of our raw materials from overseas suppliers, actively participate in overseas manufacturing operations and sell to a large number of international customers. During the year ended December 31, 2018, sales to customers located outside of the U.S. accounted for approximately 29% of our consolidated net sales. As a result of doing business internationally, we face risks associated with the following:

- changes in tariff regulations, which may make our products more costly to export or import;
- changes in monetary and fiscal policies, laws and regulations, and other activities of governments, agencies and similar organizations;
- recessions or marked declines specific to a particular country or region;
- the potential imposition of trade restrictions or prohibitions;
- the potential imposition of import tariffs or other duties or taxes;
- difficulties establishing and maintaining relationships with local original equipment manufacturers, distributors and dealers;
- difficulty in staffing and managing geographically diverse operations; and
- unstable governments or legal systems in countries in which our suppliers, manufacturing operations, and customers are located.

These and other risks may also increase the relative price of our products compared to those manufactured in other countries, thereby reducing the demand for our products in the markets in which we operate, which could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

In addition, we could be adversely affected by violations of the Foreign Corrupt Practices Act (the “FCPA”) and similar worldwide anti-bribery laws, as well as export controls and economic sanction laws. The FCPA and similar anti-bribery laws in other jurisdictions generally prohibit companies and their intermediaries from making improper payments to non-U.S. officials for the purpose of obtaining or retaining business. Our policies mandate compliance with these laws. We operate in many parts of the world that have experienced governmental corruption to some degree and, in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. We cannot assure you that our internal controls and procedures will always protect us from the improper acts committed by our employees or agents. If we are found to be liable for FCPA, export control or sanction violations, we could suffer from criminal or civil penalties or other sanctions, including loss of export privileges or authorization needed to conduct aspects of our international business, which could have a material adverse effect on our business,

prospects, financial condition, results of operations, or cash flows.

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In addition, in June 2016, voters in the United Kingdom approved an advisory referendum to withdraw from the European Union, commonly referred to as "Brexit." This referendum has created political and economic uncertainty, particularly in the United Kingdom and the European Union, and this uncertainty has persisted, and may continue to persist for years. The withdrawal could significantly disrupt the free movement of goods, services, and people between the United Kingdom and the European Union, and result in increased legal and regulatory complexities, as well as potential higher costs of conducting business in Europe. The uncertainty of Brexit has led to volatility in the British pound sterling, which has continuously fluctuated as new developments regarding Brexit have been made public since the initial referendum. The United Kingdom's Parliament voted down a transition deal between the United Kingdom and the European Union on January 15, 2019. A continued inability of Parliament to approve a Brexit deal could result in a "hard Brexit" in which the United Kingdom leaves the European Union in March 29, 2019 with no deal in place. A "hard Brexit" would take immediate effect, with no transition period established (i) for the United Kingdom and the European Union to establish a trading relationship or (ii) to allow businesses and individuals to prepare for post-Brexit changes in legal and regulatory structure. The United Kingdom's vote to exit the European Union could also result in similar referendums or votes in other European countries in which we do business. The uncertainty surrounding the terms of the United Kingdom's withdrawal and its consequences could adversely impact consumer and investor confidence, and the level of consumer purchases of discretionary items and retail products, including our products. Any of these effects, among others, could materially adversely affect our business, results of operations, and financial condition.

In addition, the prices we pay for raw materials used in our products may be impacted by tariffs. The tariffs initiated by the U.S. government in 2018 under Section 232 of the Trade Expansion Act of 1962 resulted in increased metals prices in the United States. Any future tariffs or quotas imposed on steel and aluminum imports may increase the price of metal, which could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

Failure of our products could result in a product recall.

The majority of our products are components of our customers' products that are used in critical industrial applications. A failure of our components could lead to a product recall. If a recall were to happen as a result of our components failing, we could bear a substantial part of the cost of correction. In addition to the cost of fixing the parts affected by the component, a recall could result in the loss of a portion of or all of the customer's business and damage our reputation. A successful product recall claim requiring that we bear a substantial part of the cost of correction or the loss of a key customer could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

Our markets are highly competitive, and many of our competitors have significant advantages that could adversely affect our business.

We face substantial competition in the sale of components, system subassemblies, and finished devices in the vertical end markets into which we sell our products. Our competitors are continuously exploring and implementing improvements in technology and manufacturing processes in order to improve product quality, and our ability to remain competitive will depend, among other things, on whether we are able to keep pace with such quality improvements in a cost-effective manner. Due to this competitiveness, we may not be able to increase prices for our products to cover cost increases. In many cases we face pressure from our customers to reduce prices, which could adversely affect our business, prospects, financial condition, results of operations, or cash flows. In addition, our customers may choose to purchase products from one of our competitors rather than pay the prices we seek for our products, which could adversely affect our business, prospects, financial condition, results of operations, or cash flows.

Any loss of key personnel and the inability to attract and retain qualified employees could have a material adverse impact on our operations.

We are dependent on the continued services of key executives and personnel. The departure of our key personnel without adequate replacement could severely disrupt our business operations. Additionally, we need qualified managers and skilled employees with technical and manufacturing industry experience to operate our businesses successfully. From time to time, there may be shortages of skilled labor, which may make it more difficult and

expensive for us to attract and retain qualified employees. If we are unable to attract and retain qualified individuals or our costs to do so increase significantly, our operations would be materially adversely affected.

Damage to our reputation could harm our businesses, including our competitive position and business prospects.

Our ability to attract and retain customers, supplier, investors and employees is impacted by our reputation. Harm to our reputation can arise from various sources, including employee misconduct, security breaches, unethical behavior, litigation or

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regulatory outcomes. The consequences of damage to our reputation include, among other things, increasing the number of litigation claims and the size of damages asserted or subjecting us to enforcement actions, fines, and penalties, all of which would cause us to incur significant defense related costs and expenses.

Risks Related to Legal and Regulatory Compliance

Environmental, health and safety laws and regulations impose substantial costs and limitations on our operations, environmental compliance may be more costly than we expect, and any adverse regulatory action may materially adversely affect our business.

We are subject to extensive federal, state, local and foreign environmental, health and safety laws and regulations concerning matters such as air emissions, wastewater discharges, solid and hazardous waste handling and disposal and the investigation and remediation of contamination. The risks of substantial costs, liabilities and limitations on our operations related to compliance with these laws and regulations are an inherent part of our business, and future conditions may develop, arise or be discovered that create substantial environmental compliance or remediation liabilities and costs.

Compliance with environmental, health and safety legislation and regulatory requirements may prove to be more limiting and costly than we anticipate. To date, we have committed significant expenditures in our efforts to achieve and maintain compliance with these requirements at our facilities, and we expect that we will continue to make significant expenditures related to such compliance in the future. From time to time, we may be subject to legal proceedings brought by private parties or governmental authorities with respect to environmental matters, including matters involving alleged noncompliance with or liability under environmental, health and safety laws, property damage or personal injury. New laws and regulations, including those which may relate to emissions of greenhouse gases, stricter enforcement of existing laws and regulations, the discovery of previously unknown contamination or the imposition of new clean-up requirements could require us to incur costs or become the basis for new or increased liabilities that could have a material adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

Our medical devices are subject to regulation by numerous government agencies, including the FDA and comparable agencies outside the U.S. To varying degrees, each of these agencies requires us to comply with laws and regulations governing the development, testing, manufacturing, labeling, marketing and distribution of our medical devices. We cannot guarantee that we will be able to obtain marketing clearance for our new products or enhancements or modifications to existing products. If such approval is obtained, it may:

- take a significant amount of time;
- require the expenditure of substantial resources;
- involve stringent clinical and pre-clinical testing, as well as increased post-market surveillance;
- involve modifications, repairs or replacements of our products; and
- result in limitations on the proposed uses of our products.

Both before and after a product is commercially released, we have ongoing responsibilities under FDA regulations. We are also subject to periodic inspections by the FDA to determine compliance with the FDA’s requirements, including primarily the quality system regulations and medical device reporting regulations. The results of these inspections can include inspectional observations on FDA’s Form-483, warning letters, or other forms of enforcement. Since 2009, the FDA has significantly increased its oversight of companies subject to its regulations, including medical device companies, by hiring new investigators and stepping up inspections of manufacturing facilities. The FDA has also significantly increased the number of warning letters issued to companies. If the FDA were to conclude that we are not in compliance with applicable laws or regulations, or that any of our medical devices are ineffective or pose an unreasonable health risk, the FDA could ban such medical devices, detain or seize adulterated or misbranded medical devices, order a recall, repair, replacement or refund of such devices, refuse to grant pending pre-market approval applications or require certificates of foreign governments for exports, and/or require us to notify health professionals and others that the devices present unreasonable risks of substantial harm to the public health. The FDA may also impose operating restrictions on a company-wide basis, enjoin and/or restrain certain conduct resulting in violations of applicable law pertaining to medical devices, and assess civil or criminal penalties against our officers,

employees, or us. The FDA may also recommend prosecution to the Department of Justice. Any adverse regulatory action, depending on its magnitude, may restrict us from effectively marketing and selling our products.

Foreign governmental regulations have become increasingly stringent and more common, and we may become subject to more rigorous regulation by foreign governmental authorities in the future. Penalties for a company's non-compliance with foreign governmental regulation could be severe, including revocation or suspension of a company's business license and criminal sanctions. Any domestic or foreign governmental law or regulation imposed in the future may have a material adverse effect on us.

Changes in U.S. tax laws could have a material adverse effect on our business, cash flow, results of operations and financial condition.

Changes in U.S. tax laws, tax rulings, or interpretations of existing laws could materially affect our business, cash flow, results of operations, and financial condition. In particular, on December 22, 2017, the U.S. government enacted comprehensive Federal tax legislation commonly referred to as the Tax Cuts and Jobs Act of 2017 (the "U.S. Tax Cuts and Jobs Act of 2017"). The U.S. Tax Cuts and Jobs Act of 2017 introduces significant changes to U.S. income tax law that have had a meaningful impact on our provision for income taxes. Accounting for the income tax effects of the U.S. Tax Cuts and Jobs Act of 2017 requires significant judgments and estimates in the interpretation and calculations of the provisions of the U.S. Tax Cuts and Jobs Act of 2017.

We have identified a material weakness in our internal control over financial reporting which could, if not remediated, result in material misstatements in our financial statements.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) under the Exchange Act. Management disclosed in its 2017 Annual Report on Form 10-K certain material weaknesses in our internal control over financial reporting. Although we were successful in remediating three of the four material weaknesses during 2018, we were unsuccessful in remediating all of them. As a result, our management concluded that we did not maintain effective internal control over financial reporting as of December 31, 2018. With the oversight of senior management and the audit committee, we have begun taking steps to remediate the underlying cause of the remaining material weakness and improve our control environment. Until remediated, this material weakness could result in future errors to our financial statements.

If we are unable to successfully remediate this material weakness in our internal control over financial reporting, or if we identify any additional material weaknesses that may exist, the accuracy and timing of our financial reporting may be adversely affected. Our failure to file periodic and certain current reports with the SEC in a timely manner, among other things, could in the future preclude or delay us from being eligible to use a short form registration statement on Form S-3 to register certain sales of our common stock by us or our stockholders and could even result in the suspension of trading of our common stock on the Nasdaq Stock Market LLC ("Nasdaq") and/or the revocation of our registration by the SEC. Any of these consequences may have a material adverse effect on our business and results of operations.

Risks Related to Our Capitalization

Our indebtedness could adversely affect our business, prospects, financial condition, results of operations, or cash flows.

As of December 31, 2018, we had approximately $859.6 million of indebtedness outstanding and an additional $76.6 million of unused borrowings under our debt agreements. Our high degree of leverage could have important consequences, including:

- increasing our vulnerability to adverse economic, industry, or competitive developments;
- requiring a substantial portion of our cash flows from operations to be dedicated to the payment of principal and interest on our indebtedness, therefore reducing our ability to use our cash flows to fund operations, capital expenditures, and future business opportunities;
- exposing us to the risk of increased interest rates, which could cause our debt service obligations to increase significantly;
- making it more difficult for us to satisfy our obligations with respect to our indebtedness, and any failure to comply with the obligations of any of our debt instruments, including restrictive covenants and borrowing conditions, could result in an event of default under our debt agreements;
- restricting us from making strategic acquisitions or causing us to make non-strategic divestitures;
- limiting our ability to obtain additional financing for working capital, capital expenditures, product and service development, debt service requirements, acquisitions, and general corporate or other purposes; and
- limiting our flexibility in planning for, or reacting to, changes in our business or market conditions and placing us at a competitive disadvantage compared to our competitors who are less highly leveraged and who, therefore, may be able

to take advantage of opportunities that our leverage may prevent us from exploiting.

If any one of these events were to occur, our business, prospects, financial condition, results of operations, or cash flows could be materially and adversely affected. For more information regarding our indebtedness, please see "Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources."

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Despite our high indebtedness level, we will still be able to incur substantial additional amounts of debt, which could further exacerbate the risks associated with our substantial indebtedness.

We and our subsidiaries may be able to incur substantial additional indebtedness in the future. Although our debt agreements contain restrictions on the incurrence of additional indebtedness, these restrictions are subject to a number of significant qualifications and exceptions, and under certain circumstances, the amount of indebtedness that could be incurred in compliance with these restrictions could be substantial. If new debt is added to our and our subsidiaries' debt levels, the related risks that we now face could increase.

Our debt agreements contain restrictions that will limit our flexibility in operating our business.

Our debt agreements contain various incurrence covenants that limit our ability to engage in specified types of transactions. These incurrence covenants will limit our ability to, among other things:

- incur additional indebtedness or issue certain preferred equity;
- pay dividends on, repurchase, or make distributions in respect of our capital stock, prepay, redeem, or repurchase certain debt or make other restricted payments;
- make certain investments and acquisitions;
- create certain liens;
- enter into agreements restricting our subsidiaries' ability to pay dividends to us;
- consolidate, merge, sell or otherwise dispose of all or substantially all of our assets;
- alter our existing businesses; and
- enter into certain transactions with our affiliates.

In addition, the incurrence covenants in our debt agreements require us to meet specified financial ratios and satisfy other financial condition tests. Our ability to meet those financial ratios and tests will depend on our ongoing financial and operating performance, which, in turn, will be subject to economic conditions and to financial, market, and competitive factors, many of which are beyond our control. A breach of any of these covenants could result in a default under one or more of our debt agreements and permit our lenders to cease making loans to us under our credit facility (as defined below). Furthermore, if we were unable to repay the amounts due and payable under our secured debt agreements, our secured lenders could proceed against the collateral granted to them to secure our borrowings. Such actions by the lenders could also cause cross defaults under our other debt agreements.

We may not be able to generate sufficient cash to service all of our indebtedness, and we may not be able to refinance our debt obligations as they mature.

Our ability to make scheduled payments on or to refinance our debt obligations depends on our financial condition and operating performance, which is subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond our control. We may not be able to maintain a level of cash flows from operating activities sufficient to permit us to pay the principal, premium, if any, and interest on our indebtedness.

We regularly review our capital structure, various financing alternatives and conditions in the debt and equity markets in order to opportunistically enhance our capital structure. In connection therewith, we may seek to refinance or retire existing indebtedness, incur new or additional indebtedness or issue equity or equity-linked securities, in each case, depending on market and other conditions. As our debt obligations mature or if our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to reduce or delay investments and capital expenditures, or to sell assets, seek additional capital, or restructure or refinance our indebtedness. Our ability to restructure or refinance our debt will depend on the condition of the capital markets and our financial condition at such time. Any refinancing of our debt could be at higher interest rates and may require us to comply with more onerous covenants, which could further restrict our business operations. The terms of our existing or future debt instruments may restrict us from adopting some of these alternatives. In addition, any failure to make payments of interest and principal on our outstanding indebtedness on a timely basis would likely result in a reduction of our credit rating, which could harm our ability to incur additional indebtedness. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations.

We have international operations that are subject to foreign economic uncertainties and foreign currency fluctuation.

Approximately 29% of our revenues are denominated in foreign currencies, which may result in additional risk of fluctuating currency values and exchange rates and controls on currency exchange. Changes in the value of foreign currencies could increase our U.S. dollar costs for, or reduce our U.S. dollar revenues from, our foreign operations. Any increased costs or

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reduced revenues as a result of foreign currency fluctuations could affect our profits. In 2018, the U.S. dollar strengthened compared to the Brazilian real, which unfavorably affected our revenue by $4.0 million. In contrast, a weakening of the U.S. dollar may beneficially affect our business, prospects, financial condition, results of operations, or cash flows.

The price of our common stock may be volatile.

The market price of our common stock could be subject to significant fluctuations and may decline. Among the factors that could affect our stock price are:

- macro or micro-economic factors;
- our operating and financial performance and prospects;
- quarterly variations in the rate of growth of our financial indicators, such as earnings per share, net income and revenues;
- changes in revenue or earnings estimates or publication of research reports by analysts;
- loss of any member of our senior management team;
- speculation in the press or investment community;
- strategic actions by us or our competitors, such as acquisitions or restructuring;
- sales of our common stock by stockholders;
- general market conditions;
- domestic and international economic, legal and regulatory factors unrelated to our performance;
- loss of a major customer; and
- the declaration and payment of a dividend.

The stock markets in general have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our common stock. In addition, due to the market capitalization of our stock, our stock tends to be more volatile than large capitalization stocks that comprise the Dow Jones Industrial Average or Standard and Poor’s 500 Index.

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Provisions in our charter documents and Delaware law may inhibit a takeover, which could adversely affect the value of our common stock.

Our certificate of incorporation and bylaws, as well as Delaware corporate law, contain provisions that could delay or prevent a change of control or changes in our management that a stockholder might consider favorable and may prevent shareholders from receiving a takeover premium for their shares. These provisions include, for example, a classified board of directors and the authorization of our board of directors to issue up to five million preferred shares without a stockholder vote. In addition, our certificate of incorporation provides that stockholders may not call a special meeting.

We are a Delaware corporation subject to the provisions of Section 203 of the Delaware General Corporation Law, an anti-takeover law. Generally, this statute prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder for a period of three years after the date of the transaction in which such person became an interested stockholder, unless the business combination is approved in a prescribed manner. A business combination includes a merger, asset sale or other transaction resulting in a financial benefit to the stockholder. We anticipate that the provisions of Section 203 may encourage parties interested in acquiring us to negotiate in advance with our board of directors, because the stockholder approval requirement would be avoided if a majority of the directors then in office approve either the business combination or the transaction that results in the stockholder becoming an interested stockholder.

These provisions apply even if the offer may be considered beneficial by some of our stockholders. If a change of control or change in management is delayed or prevented, the market price of our common stock could decline.

Risks Related to Acquisitions and Divestitures

Acquisitions may constitute an important part of our future growth strategy.

Acquiring businesses that complement or expand our operations has been and may continue to be a key element of our business strategy. We regularly evaluate acquisition transactions, sign non-disclosure agreements, and participate in processes with respect to acquisitions, some of which may be material to us. We cannot assure you that we will be successful in identifying attractive acquisition candidates or completing acquisitions on favorable terms in the future. In addition, we may borrow funds or issue equity to acquire other businesses, increasing our interest expense and debt levels or diluting our existing stockholders’ ownership interest in us. Our inability to acquire businesses, or to operate them profitably once acquired, could have a material adverse effect on our business, financial condition, results of operations, and cash flows. Our borrowing agreements limit our ability to complete acquisitions without prior approval of our lenders. We have had difficulty with purchase accounting and other aspects related to the accounting for our acquisitions which resulted in material weaknesses in our internal control over financial reporting. Although we have remediated these material weaknesses, there can be no assurances we will not face similar issues with respect to any future acquisitions.

We may not realize all of the anticipated benefits from completed acquisitions or any future strategic portfolio acquisition, or those benefits may take longer to realize than expected.

We either may not realize all of the anticipated benefits from completed acquisitions or any future strategic portfolio acquisition, or it may take longer to realize such benefits. Achieving those benefits depends on the timely, efficient and successful execution of a number of post-acquisition events, including integrating the acquired businesses into our existing businesses. The integration process may disrupt the businesses and, if implemented ineffectively, would preclude the realization of the full anticipated benefits. The difficulties of combining the operations of acquired companies include, among others:

- the diversion of management’s attention to integration matters;
- difficulties in the integration of operations and systems, including, without limitation, the complexities associated with managing the expanded operations of a significantly larger and more complex company, addressing possible differences in corporate cultures and management philosophies and the challenge of integrating complex systems, technology, networks and other assets of each of the acquired companies;
- difficulties in achieving anticipated cost savings, synergies, business opportunities and growth prospects from combining the acquired businesses with our own;

- the inability to implement effective internal controls, procedures and policies for acquired businesses as required by the Sarbanes-Oxley Act of 2002 within the time periods prescribed thereby;
- the exposure to potential unknown liabilities and unforeseen increased expenses or delays associated with acquired businesses;
- challenges in keeping existing customers and obtaining new customers;
- challenges in attracting and retaining key personnel; and

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- the disruption of, or the loss of momentum in, ongoing operations or inconsistencies in standards, controls, procedures and policies.

Many of these factors will be outside of our control and any one of them could result in increased costs, decreases in the amount of expected revenues and diversion of management's time and energy, which could materially impact our business, prospects, financial condition, results of operations, or cash flows.

Additionally, we incurred a significant amount of debt in connection with our acquisitions in the past few years. Finally, in relation to such acquisitions, we have significantly higher amounts of intangible assets, including goodwill. These intangible assets will be subject to impairment testing, and we could incur a significant impact to our financial statements in the form of an impairment if assumptions and expectations related to our acquisitions are not realized. During the year ended December 31, 2018, we recognized a goodwill impairment charge of $182.5 million.

We have and will continue to incur expenses related to our acquisitions and the integration of our acquired companies.

We have and will continue to incur expenses related to our acquisitions and the integration of our acquired companies. While we have assumed that a certain level of expenses will be incurred, there are many factors beyond our control that could affect the total amount or the timing of the integration expenses. Moreover, many of the expenses that will be incurred are, by their nature, difficult to estimate accurately. These integration expenses may result in us taking charges against earnings, and the amount of any future charges are uncertain at present.

We may be unable to realize the anticipated cost or capital expenditure savings or may incur additional and/or unexpected costs in order to realize them.

There can be no assurance that we will be able to realize the anticipated cost or capital expenditure savings from our acquisitions in the anticipated amounts or within the anticipated timeframes or at all. With respect to each acquisition, we anticipate implementing a series of cost savings initiatives that we expect to result in recurring, annual run-rate cost savings. These or any other cost or capital expenditure savings that we realize may differ materially from our estimates. We cannot provide assurances that these anticipated savings will be achieved or that our programs and improvements will be completed as anticipated or at all. In addition, any cost savings that we realize may be offset, in whole or in part, by reductions in revenues or through increases in other expenses.

Our projections and assumptions related to cost savings are based on our current estimates, but they involve risks, uncertainties, projections and other factors that may cause actual results, performance or achievements to be materially different from any future results, performance or achievements, express or implied. Neither our independent registered public accounting firm nor any other independent auditors, have examined, compiled or performed any procedures with respect to these projections, nor have they expressed any opinion, or any other form of assurance on such information or their achievability. Assumptions relating to our projections involve subjective decisions and judgments with respect to, among other things, the estimated impact of certain operational adjustments, including Six Sigma/OpEx optimization programs, product grouping and rationalization, facility rationalization and shared services cost savings and other cost and savings adjustments, as well as future economic, competitive, industry and market conditions and future business decisions, all of which are inherently uncertain and may be beyond the control of our management.

Failure to realize the expected costs savings and operating synergies related to our acquisitions could result in increased costs and have an adverse effect on our business, prospects, financial condition, results of operations, or cash flows.

Our future results could suffer if we cannot effectively manage our expanded operations, which are significantly larger and more complex following our acquisitions.

As a result of our acquisitions over the past few years, the size and scope of our operations were significantly increased. Our future success depends, in part, upon our ability to manage the expanded operations, which will pose challenges for management, including challenges related to the management and monitoring of new operations and associated increased costs and complexity. We may not have the expertise, experience and resources to pursue or successfully operate all of our businesses at once. The administration of our businesses requires implementation and oversight of appropriate operations, management, compliance and financial reporting systems and controls. We may experience difficulties in effectively implementing and overseeing these and other systems. Such implementation and initial oversight will require the focused attention of our management team, including a significant commitment of its

time and resources. The need for management to focus on these matters could have a material and adverse impact on our revenues and operating results. There can be no assurance that we will be successful or that we will realize any operating efficiencies, cost savings, revenue enhancements or other benefits currently anticipated from our acquisitions.

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

Certain of the acquisition agreements from past acquisitions require the former owners to indemnify us against certain liabilities related to the operation of each of their companies before we acquired it. In most of these agreements, however, the liability of the former owners is limited in amount and duration and certain former owners may not be able to meet their indemnification responsibilities. These indemnification provisions may not fully protect us, and as a result we may face unexpected liabilities that adversely affect our profitability and financial position.

Our participation in joint ventures could expose us to additional risks from time to time.

We currently have a 49% investment in a Chinese joint venture and may participate in additional joint ventures from time to time. Our participation in joint ventures is subject to risks that may not be present with other methods of ownership, including:

- our joint venture partners could have investment and financing goals that are not consistent with our objectives, including the timing, terms and strategies for any investments, and what levels of debt to incur or carry;
- we could experience an impasse on certain decisions because we do not have sole decision-making authority, which could require us to expend additional resources on resolving such impasses or potential disputes, including litigation or arbitration;
- our ability to transfer our interest in a joint venture to a third party may be restricted and the market for our interest may be limited;
- our joint venture partners might become bankrupt, fail to fund their share of required capital contributions or fail to fulfill their obligations as a joint venture partner, which may require us to infuse our own capital into the venture on behalf of the partner despite other competing uses for such capital; and
- our joint venture partners may have competing interests in our markets that could create conflict of interest issues.

Any divestitures and discontinued operations could negatively impact our business and retained liabilities from businesses that we may sell could adversely affect our financial results.

As part of our portfolio management process, we review our operations for businesses which may no longer be aligned with our strategic initiatives and long-term objectives. Divestitures pose risks and challenges that could negatively impact our business, including required separation or carve-out activities and costs, disputes with buyers or potential impairment charges. We may also dispose of a business at a price or on terms that are less than we had previously anticipated. After reaching an agreement with a buyer for the disposition of a business, we are also subject to satisfaction of pre-closing conditions, as well as necessary regulatory and governmental approvals on acceptable terms, which may prevent us from completing a transaction. Dispositions may also involve continued financial involvement, as we may be required to retain responsibility for, or agree to indemnify buyers against contingent liabilities related to businesses sold, such as lawsuits, tax liabilities, lease payments, product liability claims or environmental matters. Under these types of arrangements, performance by the divested businesses or other conditions outside of our control could affect future financial results.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

As of December 31, 2018, we owned or leased 51 facilities in a total of seven countries, which includes a 49% equity interest in a manufacturing joint venture in China. Utilization of these sites may vary with product mix and economic, seasonal, and other business conditions. Our plants generally have sufficient capacity for existing needs and expected near-term growth. These plants are generally well maintained, in good operating condition, and suitable and adequate for their use. The following table lists the locations of our facilities by segment.

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Mobile Solutions Group

Location	General Character	Country	Owned or Leased
Boituva	Plant	Brazil	Leased
Campinas	Office	Brazil	Leased
Dowagiac, Michigan	Plant	U.S.A.	Owned
Juarez	Plant	Mexico	Leased
Kamienna Gora	Plant	Poland	Owned
Kentwood, Michigan	Plant 1	U.S.A.	Leased
Kentwood, Michigan	Plant 2	U.S.A.	Leased
Kentwood, Michigan	Plant 3, Warehouse	U.S.A.	Leased
Kentwood, Michigan	Office	U.S.A.	Owned
Marnaz	Plant	France	Owned
Marshall, Michigan	Plant 1	U.S.A.	Leased
Marshall, Michigan	Plant 2	U.S.A.	Leased
Sao Joao da Boa Vista	Plant 1	Brazil	Leased
Sao Joao da Boa Vista	Plant 2	Brazil	Leased
Wellington, Ohio	Plant 1	U.S.A.	Leased
Wellington, Ohio	Plant 2	U.S.A.	Leased
Wuxi	Plant	China	Leased

Power Solutions Group

Location	General Character	Country	Owned or Leased
Algonquin, Illinois	Plant	U.S.A.	Owned
Attleboro, Massachusetts	Plant 1	U.S.A.	Owned
Attleboro, Massachusetts	Plant 2	U.S.A.	Leased
Attleboro, Massachusetts	Plant 3	U.S.A.	Owned
Attleboro, Massachusetts	Office	U.S.A.	Leased
Fairfield, Ohio	Plant	U.S.A.	Owned
Foshan City	Plant	China	Leased
Franklin, Massachusetts	Plant	U.S.A.	Leased
Hingham, Massachusetts	Plant	U.S.A.	Leased
Irvine, California	Plant	U.S.A.	Leased
Lubbock, Texas	Plant	U.S.A.	Owned
Mexico City	Plant	Mexico	Owned
North Attleboro, Massachusetts	Plant	U.S.A.	Owned
Palmer, Massachusetts	Plant	U.S.A.	Leased
Placentia, California	Plant	U.S.A.	Leased

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Life Sciences Group

Location	General Character	Country	Owned or Leased
Aurora, Illinois	Plant	U.S.A.	Leased
Bridgeport, Connecticut	Plant 1	U.S.A.	Owned
Bridgeport, Connecticut	Plant 2	U.S.A.	Owned
Changzhou	Plant	China	Leased
East Providence, Rhode Island	Plant	U.S.A.	Leased
Hatfield, Pennsylvania	Plant	U.S.A.	Leased
Indianapolis, Indiana	Plant	U.S.A.	Leased
Lausanne	Office	Switzerland	Leased
Mansfield, Massachusetts	Plant	U.S.A.	Leased
Mansfield, Massachusetts	Warehouse	U.S.A.	Leased
Pierceton, Indiana	Plant	U.S.A.	Leased
Siechnice	Plant	Poland	Owned
Smithfield, Utah	Plant	U.S.A.	Leased
Vandalia, Ohio	Plant	U.S.A.	Leased
Wallingford, Connecticut	Plant	U.S.A.	Leased
Warsaw, Indiana	Plant	U.S.A.	Leased

Joint Venture

Location	General Character	Country	Owned or Leased
Wuxi	Plant	China	Leased

In addition to these manufacturing plants, we lease an office building in Johnson City, Tennessee, which serves as our global shared services center, and an office building in Charlotte, North Carolina, which serves as our corporate headquarters.

Item 3. Legal Proceedings

Prior to the Autocam acquisition, Autocam's Brazilian subsidiary received notification from the Brazilian tax authorities regarding ICMS (State Value Added Tax or VAT) tax credits claimed on intermediary materials (tooling and perishable items) used in the manufacturing process. The Brazilian tax authority notification disallowed state ICMS credits claimed on intermediary materials based on the argument that these items are not intrinsically related to the manufacturing processes. Autocam Brazil filed an administrative defense with the Brazilian tax authority arguing, among other matters, that it should qualify for ICMS tax credit, contending that the intermediary materials are directly related to the manufacturing process. The matter encompasses several lawsuits filed with Brazilian courts requesting declaratory actions that no tax is due or seeking a stay of execution on the collection of the tax. In 2018, we obtained a favorable decision in one of the declaratory actions for which the period for appeal has expired. We have filed actions in each court requesting dismissal of the matter based on the earlier court action. Although we anticipate a favorable resolution to all matters, we can provide no assurances that we will be successful in achieving dismissal of all pending cases.

We believe that we have substantial legal and factual defenses, and we plan to defend our interests in this matter vigorously. While we believe a loss is not probable, we estimate the range of possible losses related to this assessment is from $0 to $6.0 million. No amount was accrued at December 31, 2018, for this matter. There was no material change in the status of this matter during 2018.

We are entitled to indemnification from the former shareholders of Autocam, subject to the limitations and procedures set forth in the agreement and plan of merger relating to the Autocam acquisition. Management believes the indemnification would include amounts owed for the tax, interest and penalties related to this matter.

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All other legal proceedings are of an ordinary and routine nature and are incidental to our operations. Management believes that such proceedings should not, individually or in the aggregate, have a material adverse effect on our business, financial condition, results of operations, or cash flows. In making that determination, we analyze the facts and circumstances of each case at least quarterly in consultation with our attorneys and determine a range of reasonably possible outcomes. The procedures performed include reviewing attorney and plaintiff correspondence, reviewing any filings made and discussing the facts of the case with local management and legal counsel. We have not recognized any material loss contingencies at December 31, 2018, or at December 31, 2017.

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

Our common stock is traded on Nasdaq under the trading symbol "NNBR." As of March 8, 2019, there were approximately 8,100 beneficial owners of record of our common stock, and the closing per share stock price as reported by Nasdaq was $9.51.

The following graph and table compare the cumulative total shareholder return on our common stock with the cumulative total shareholder return of: (i) the S&P SmallCap 600 Index and (ii) a customized peer group, for the period from December 31, 2013, to December 31, 2018. The customized peer group consists of the following companies, which we believe are in similar lines of business: Actuant Corporation, Altra Industrial Motion Corp., Ametek Inc., CIRCOR International, Inc., Colfax Corporation, Crane, Kaman Corporation, Park-Ohio Holdings Corp. and Worthington Industries, Inc. (collectively, the "Peer Group"). The following graph and table assume that a $100 investment was made at the close of trading on December 31, 2013, in our common stock and in the S&P SmallCap Index and the Peer Group. We cannot assure you that the performance of our common stock will continue in the future with the same or similar trend depicted on the graph.

Comparison of Five-Year Cumulative Total Return
NN, Inc., Peer Group, and S&P SmallCap 600 Index
(Performance results through 12/31/2018)

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	2013	2014	2015	2016	2017	2018
NN, Inc.	$100.00	$103.10	$80.91	$98.44	$144.20	$35.74
Peer Group	$100.00	$89.60	$76.12	$89.29	$112.75	$92.40
S&P SmallCap 600	$100.00	$105.76	$103.68	$131.21	$148.57	$135.97

Source: Value Line Publishing LLC

The declaration and payment of dividends are subject to the sole discretion of our Board of Directors and depend upon our profitability, financial condition, capital needs, credit agreement restrictions, future prospects and other factors deemed relevant by the Board of Directors.

See Part III, Item 12 – "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters" of this Annual Report on Form 10-K for information required by Item 201 (d) of Regulation S-K.

Item 6. Selected Financial Data

The following selected financial data has been derived from our audited financial statements. The selected financial data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Item 7 and the audited Consolidated Financial Statements, including the Notes thereto, in Item 8.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
Statement of Operations Data:					
Net sales	$770,657	$619,793	$584,954	$405,443	$210,575
Cost of sales (exclusive of depreciation and amortization)	588,205	459,080	428,843	320,632	169,263
Goodwill impairment	182,542	—	—	—	—
Income (loss) from operations	(178,888)	33,114	34,779	58	(3,776)
Income (loss) from continuing operations	(264,467)	25,364	(9,490)	(24,375)	(12,788)
Income from discontinued operations, net of tax	—	137,688	16,153	17,889	21,005
Income (loss) from continuing operations per share, basic	$(8.35)	$0.92	$(0.35)	$(1.15)	$(0.71)
Income (loss) from continuing operations per share, diluted	$(8.35)	$0.91	$(0.35)	$(1.15)	$(0.71)
Cash dividends declared per common share	$0.28	$0.28	$0.28	$0.28	$0.28
	As of December 31,				
	2018	2017	2016 [(1)]	2015 [(1)]	2014 [(1)]
Balance Sheet Data:					
Current assets	$296,871	$477,280	$282,328	$283,910	$245,131
Current liabilities	145,030	108,421	140,241	132,491	138,485
Total assets	1,501,570	1,475,003	1,358,274	1,388,337	703,892
Long-term obligations	817,549	792,499	788,953	802,011	327,759
Stockholders' equity	418,295	486,104	309,391	312,431	172,989

(1) Current assets of discontinued operations were $106.7 million, $98.9 million, and $106.3 million as of December 31, 2016, 2015, and 2014, respectively. Current liabilities of discontinued operations were $45.2 million, $44.6 million, and $54.9 million as of December 31, 2016, 2015, and 2014, respectively. Total assets of discontinued operations were $210.7 million, $204.4 million, $214.3 million as of December 31, 2016, 2015, and 2014, respectively.

During 2018, we recognized goodwill impairment charges of $182.5 million as described in Note 8 to the consolidated financial statements and issued shares of common stock in a public offering as described in Note 15 to the consolidated financial statements. Additionally, acquisitions made in 2018 and 2017 contributed net sales and income from operations of $153.0 million and $10.4 million, respectively, for the year ended December 31, 2018, as described in Note 3 to the consolidated financial statements, .

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During 2017, we completed the sale of our global precision bearing components business (the "PBC Business") and recorded an after-tax gain on sale of $127.7 million as described Note 2 to the consolidate financial statements. Also during 2017, we acquired DRT Medical, subsequently renamed NN Life Sciences - Vandalia, LLC ("NN Vandalia"), which contributed $30.7 million to net sales and $1.5 million to income from operations during the year ended December 31, 2018 and $6.7 million to net sales and $0.5 million to loss from operations during the year ended December 31, 2017 as described in Note 3 to the consolidated financial statements.

During 2016, we recognized an increase in net sales of $174.2 million and increase in income from operations of $38.5 million primarily due to the acquisition of our former Precision Engineered Products Group.

During 2015, we acquired two businesses, including our former Precision Engineered Products group, which contributed $40.7 million to net sales and $5.1 million to loss from operations during the year ended December 31, 2015. Also during 2015, we issued shares of common shares in a public offering with net proceeds used for repayment of principal and interest on existing debt.

During 2014, we acquired several businesses including Autocam Corporation, which is now the Mobile Solutions group. For the year ended December 31, 2014, the acquisitions contributed $100.7 million to net sales and $5.8 million to income from operations.

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

The following discussion should be read in conjunction with, and is qualified in its entirety by, the Consolidated Financial Statements and the Notes thereto and Selected Financial Data included elsewhere in this Annual Report on Form 10-K. Historical operating results and percentage relationships among any amounts included in the Consolidated Financial Statements are not necessarily indicative of trends in operating results for any future period. Unless otherwise noted herein, all amounts are in thousands, except per share numbers.

Overview and Management Focus

Our strategy and management focus are based upon the following long-term objectives

- Organic and acquisitive growth within all our segments;
- Sales growth in adjacent markets
- Sales growth through acquisitions; and
- Global expansion of our manufacturing base to better address the global requirements of our customers.

Management generally focuses on these trends and relevant market indicators

- Global industrial growth and economics;
- Residential and non-residential construction rates;
- Global automotive production rates;
- Surgery rates and U.S. healthcare spending;
- Costs subject to the global inflationary environment, including, but not limited to:
- Raw materials;
- Wages and benefits, including health care costs;
- Regulatory compliance; and
- Energy;
- Trends related to the geographic migration of competitive manufacturing;
- Regulatory environment for United States public companies and manufacturing companies;
- Currency and exchange rate movements and trends;
- Interest rate levels and expectations; and
- Changes in tariff regulations.

Management generally focuses on the following key indicators of operating performance

- Sales growth;

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- Cost of sales;
- Selling, general and administrative expense;
- Earnings before interest, taxes, depreciation and amortization;
- Return on invested capital;
- Income from operations and adjusted income from operations;
- Net income and adjusted net income;
- Cash flow from operations and capital spending;
- Customer service reliability;
- External and internal quality indicators; and
- Employee development.

Critical Accounting Policies

Our significant accounting policies, including the assumptions and judgment underlying them, are disclosed in Note 1 of the Notes to Consolidated Financial Statements. These policies have been consistently applied in all material respects and address such matters as revenue recognition, inventory valuation, and asset impairment recognition. Due to the estimation processes involved, management considers the following summarized accounting policies and their application to be critical to understanding our business operations, financial condition and results of operations. We cannot assure you that actual results will not significantly differ from the estimates used in these critical accounting policies.

Business Combinations

We allocate the total purchase price of tangible and intangible assets acquired and liabilities assumed based on their estimated fair values as of the business combination date, with the excess purchase price recorded as goodwill. The purchase price allocation process requires us to use significant estimates and assumptions, including fair value estimates, as of the business combination date. Although we believe the assumptions and estimates we have made are reasonable and appropriate, they are based in part on historical experience and information obtained from management of the acquired company. Our assumptions and estimates are also partially based on valuation models that incorporate projections of expected future cash flows and operating plans and are inherently uncertain. Valuations are performed by management or third-party valuation specialists under management's supervision. In determining the fair value of assets acquired and liabilities assumed in business combinations, as appropriate, we may use one of the following recognized valuation methods: the income approach (including discounted cash flows, relief from royalty and excess earnings model), the market approach, or the replacement cost approach.

Examples of significant estimates used to value certain intangible assets acquired include but are not limited to:

- sales volume, pricing and future cash flows of the business overall;
- future expected cash flows from customer relationships, and other identifiable intangible assets, including future price levels, rates of increase in revenue and appropriate attrition rate;
- the acquired company's brand and competitive position, royalty rate quantum, as well as assumptions about the period of time the acquired brand will continue to benefit the combined company's product portfolio; and
- cost of capital, risk-adjusted discount rates, and income tax rates.

Different assumptions regarding projected performance and other factors associated with the acquired assets may affect the amount recorded under each type of asset and liability. The valuations of property, plant and equipment, intangible assets, goodwill and deferred income tax liabilities depend heavily on assumptions. Subsequent assessment could result in future impairment charges. We refine these estimates over a measurement period not to exceed one year to reflect new information obtained surrounding facts and circumstances existing at the acquisition date.

Goodwill and Other Indefinite Lived Intangible Assets

Goodwill is tested for impairment on an annual basis in the fourth quarter and between annual tests if a triggering event occurs. The impairment analysis is performed at the reporting unit level. For the impairment test as of October 1, 2018, we elected to early adopt the new goodwill accounting standard which requires us to calculate an impairment charge based on a reporting unit's carrying amount in excess of its fair value (i.e., step 1 of the two-step impairment test). If the carrying value of the reporting unit including goodwill is less than fair value of the reporting unit, the

goodwill is not considered impaired. Under the new guidance, we no longer perform step 2 of the two-step goodwill impairment test or calculate an impairment charge using

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an implied fair value. Based on the results of performing the first step of the impairment test, the carrying value of certain reporting units exceed the fair value at December 31, 2018. For the year ended December 31, 2018, we recorded an impairment charge of $182.5 million to the Consolidated Statements of Operations and Comprehensive Income (Loss).

Power Solutions goodwill as of December 31, 2018 was $94.5 million. In conjunction with the annual goodwill impairment test during the fourth quarter of 2018, Power Solutions goodwill was impaired by $109.1 million, resulting in the carrying value of the reporting unit being equal to its fair value. If our assessment of the relevant facts and circumstances change, or if the actual performance falls short of expected results, an additional impairment charge will be required. An impairment of goodwill may also lead us to record an impairment of other intangible assets. The carrying value of finite-lived intangible assets for the Power Solutions group as of December 31, 2018 was $96.0 million.

Life Sciences has largely grown through acquisitions, with two acquisitions in 2018 plus another acquisition in late-2017. The Company is forecasting continued growth for the Life Sciences group; however, the fair value of the reporting unit exceeds the carrying value by approximately 3.7% in the most recent valuation. If our assessment of the relevant facts and circumstances change, or the actual performance falls short of expected results, the result may lead to impairment charges. Total goodwill for the Life Sciences group as of December 31, 2018 was $344.9 million. An impairment of goodwill may also lead us to record an impairment of other intangible assets. The carrying amount of finite-lived intangible assets for the Life Sciences group as of December 31, 2018 was $244.4 million. See Note 8 for further discussion on goodwill.

For the year ended, December 31, 2017, we performed the two-step goodwill impairment test under accounting standards in effect at that time. Based on the results of performing the first step of the impairment test, the fair value of the reporting units exceeded the carrying value of the reporting units at December 31, 2017.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. Provision has been made for income taxes on unremitted earnings of certain foreign subsidiaries as these earnings are not deemed to be permanently reinvested. We recognize income tax positions that meet the more likely than not threshold and accrue interest and potential penalties related to unrecognized income tax positions which are recorded as a component of the provision (benefit) for income taxes.

The calculation of tax assets, liabilities, and expenses under U.S. GAAP is largely dependent on management judgment of the current and future deductibility and utilization of taxable expenses and benefits using a more likely than not threshold. Specifically, the realization of deferred tax assets and the certainty of tax positions taken are largely dependent upon management weighting the current positive and negative evidence for recording tax benefits and expenses. Additionally, many of our positions are based on future estimates of taxable income and deductibility of tax positions. Particularly, our assertion of permanent reinvestment of foreign undistributed earnings is largely based on management’s future estimates of domestic and foreign cash flows and current strategic foreign investment plans. In the event that the actual outcome from future tax consequences differs from management estimates and assumptions or management plans and positions are amended, the resulting change to the provision for income taxes could have a material impact on the consolidated results of operations and financial position. (See Note 1 and Note 11 of the Notes to Consolidated Financial Statements).

As of December 31, 2018, the Company is not asserting indefinite reinvestment on unremitted earnings of certain foreign subsidiaries in China and Mexico. We have recorded a U.S. deferred tax liability as applicable for these subsidiaries. All other foreign earnings continue to be considered indefinitely reinvested.

Impairment of Long-Lived Assets

Long-lived tangible and intangible assets subject to depreciation or amortization are tested for recoverability when changes in circumstances indicate the carrying value of these assets may not be recoverable. A test for recoverability is also performed when management has committed to a plan to dispose of a reporting unit or asset group. Assets to be held and used are tested for recoverability when indications of impairment are evident. Recoverability of a long-lived tangible or intangible asset is evaluated by comparing its carrying value to the future estimated undiscounted cash flows expected to be generated by the asset or asset group. If the asset is not recoverable, then the asset is considered impaired and adjusted to fair value which is then depreciated or amortized over its remaining useful life. Assets to be disposed of are recorded at the lesser of carrying value or fair value less costs of disposal. In assessing potential impairment for long-lived assets, we consider forecasted financial performance based, in large part, on management business plans and projected financial information which are subject to a high

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degree of management judgment and complexity. Future adverse changes in market conditions or adverse operating results of the underlying assets could result in having to record additional impairment charges not previously recognized.

Critical Accounting Standards Not Yet Adopted

Leases. In February 2016, the FASB issued ASU 2016-2, Leases. ASU 2016-2 creates Topic 842, Leases, ("ASC 842") in the ASC and supersedes ASC 840, Leases. Entities that hold numerous equipment and real estate leases, in particular those with numerous operating leases, will be most affected by the new guidance. The lease accounting standard is effective for NN beginning January 1, 2019, with modified retrospective adoption required and early adoption permitted. We intend to utilize the practical expedient to recognize the cumulative-effect adoption adjustment to retained earnings as of January 1, 2019, and not adjust comparative periods. The adoption of ASC 842 is expected to impact our balance sheet by adding lease-related assets and liabilities. The loan covenants in our credit facility provide for the continuation of covenant computations in accordance with U.S. GAAP prior to changes in accounting principles. Therefore, we do not expect the adoption of ASC 842 to affect our compliance. We have performed inquiries within each of our business groups and compiled information on operating and capital leases. We are using the results of these inquiries and compiled information to evaluate the impacts of the lease accounting standard on our financial position, results of operations, and related disclosures. Upon adoption, we expect that leases with terms greater than twelve months that are currently classified as operating leases and not recorded on our balance sheet will be recognized as a right-of-use asset and lease liability. We are implementing an enterprise-wide lease accounting system and are in the process of verifying data in the system that will enable us to determine the amounts of those assets and liabilities. We have reviewed all leases and are in the process of documenting our conclusions, establishing internal controls, and determining discount rates to generate the initial accounting entries upon adoption of the standard. We expect the right-of-use asset and lease liability to be between $65.0 million and $95.0 million each.

Results of Operations

Factors That May Influence Results of Operations

The following paragraphs describe factors that have influenced results of operations for the year ended December 31, 2018, that management believes are important to provide an understanding of the business and results of operations, or that may influence operations in the future.

Management Structure

In January 2018, we implemented a new enterprise and management structure designed to accelerate growth and further balance our portfolio by aligning our strategic assets and businesses. Our businesses were reorganized into the Mobile Solutions, Power Solutions, and Life Sciences groups and are based principally on the end markets they serve. The Autocam Precision Components Group reported in our historical financial statements was renamed as Mobile Solutions. The Mobile Solutions group is focused on growth in the general industrial and automotive end markets. The Precision Engineered Products Group reported in our historical financial statements was bifurcated into two new groups – Power Solutions and Life Sciences. The Power Solutions group is focused on growth in the electrical and aerospace and defense end markets. The Life Sciences group is focused on growth in the medical end market. In the first quarter of 2018, we began reporting our financial results based on these new reportable segments. Prior year amounts have been revised to confirm to the current year presentation.

Acquisitions

On May 7, 2018, we acquired 100% of the stock of PMG Intermediate Holding Corporation, the parent company of Paragon Medical for a base purchase price of $375.0 million in cash, subject to certain adjustments. After working capital and other closing adjustments, the cash purchase price was approximately $390.9 million which included $13.6 million in cash acquired. During the year ended December 31, 2018, we received $1.4 million additional cash from the seller to settle working capital adjustments. For accounting purposes, Paragon Medical meets the definition of a business and has been accounted for as a business combination. Paragon Medical is a medical device manufacturer

which focuses on the orthopedic, case and tray, implant, and instrument markets. This acquisition continues our strategic focus to expand our Life Sciences portfolio as well as create a balanced business by diversifying our products and finished device offerings. Operating results of Paragon Medical are reported prospectively from the date of acquisition in our Life Sciences group. We have performed an assessment of the opening balance sheet which is subject to completion of our integration procedures for accounting policies. Opening balance sheet deferred taxes have been recorded based on estimates made as of the acquisition date as well as information currently available to management. As estimates are refined and additional information is received throughout the measurement period,

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adjustments to opening deferred taxes may be recorded with an offsetting adjustment to goodwill. We incurred new debt in connection with the Paragon Medical acquisition and subsequently repaid the new debt in full with the proceeds from the sale of shares of our common stock. In connection with the closing of the Paragon Medical acquisition, we entered into the Second Lien Credit Agreement for the Second Lien Facility. We utilized the net proceeds from the Second Lien Facility, together with cash on hand, to pay the Paragon Medical purchase price and fees and expenses related to the acquisition. We also entered into an amendment to our existing credit facility to permit the Paragon Medical acquisition, to permit the Second Lien Credit Agreement, and to amend certain covenants (refer to Note 12 to the consolidated financial statements for additional disclosure).
On September 18, 2018, we issued 14.4 million shares of our common stock in a registered public offering. Net proceeds of approximately $217.3 million were used to repay the Second Lien Facility and a portion of the Senior Secured Revolver.

On February 22, 2018, we completed the acquisition of 100% of the assets of Bridgemedica. For accounting purposes, Bridgemedica meets the definition of a business and has been accounted for as a business combination. Bridgemedica is a medical device company that provides concept to supply solutions through design, development engineering and manufacturing. Operating results of Bridgemedica are reported prospectively in our Life Sciences group after the acquisition date. We have finalized our valuation related to the assets acquired and liabilities assumed.

On August 9, 2018, we completed the acquisition of 100% of the capital stock of Technical Arts. For accounting purposes, Technical Arts meets the definition of a business and has been accounted for as a business combination. Technical Arts is an industrial machining company that manufactures tight tolerance metal components and assemblies. The acquisition of Technical Arts expands the NN presence in the aerospace and defense end market. Operating results of Technical Arts are reported prospectively in our Power Solutions group after the acquisition date. We have completed a preliminary purchase price allocation and are in the process of finalizing the fair value of assets acquired and liabilities assumed.

As discussed in our 2017 Annual Report, on October 2, 2017, we completed the acquisition of NN Vandalia, a supplier of precision manufactured medical instruments and orthopedic implants with locations in Ohio and Pennsylvania.

Discontinued Operations

On August 17, 2017, we completed the sale of our PBC Business. The PBC Business included all our facilities that were engaged in the production of precision steel balls, steel rollers, and metal retainers and automotive specialty products used primarily in the bearing industry. The sale of the PBC Business furthers management’s long-term strategy to build a diversified industrial business with a comprehensive geographic footprint in attractive high-growth market segments. The PBC Business represented all of the Precision Bearing Components Group reportable segment disclosed in our historical financial statements.

In accordance with ASC 205-20, Presentation of Financial Statements – Discontinued Operations, the operating results of the PBC Business for 2017 are classified as discontinued operations. The presentation of discontinued operations includes revenues and expenses of the discontinued operations, net of tax, as one line item on the Consolidated Statements of Operations and Comprehensive Income (Loss). All historical Consolidated Statements of Operations and Comprehensive Income (Loss) presented have been revised to reflect this presentation. Accordingly, results of the PBC Business have been excluded from continuing operations and group results for all periods presented in the consolidated financial statements and the accompanying notes unless otherwise stated. Refer to Note 2 in the Notes to Consolidated Financial Statements for more information.

Tax Reform

On December 22, 2017, the U.S. government enacted comprehensive tax legislation. The U.S. Tax Cuts and Jobs Act of 2017 (the “Tax Act”) reduced the U.S. federal corporate income tax rate from 35% to 21%, required companies to

pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred, and creates new taxes on certain foreign sourced earnings.

We have completed our accounting for the enactment of the Tax Act incorporating assumptions made based upon our current
interpretation of the Tax Act and relevant proposed regulations in accordance with Staff Accounting Bulletin No. 118. We
have also accounted for impacts of the Tax Act which became effective in 2018. The amounts recorded as it relates to the Tax
Act could change in the future as a result of further guidance and regulations being issued and evaluated.

Financial Data as a Percentage of Net Sales

The following table sets forth for the periods indicated selected financial data and the percentage of our net sales represented by each income statement line item presented.

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	Year Ended December 31,		
	2018	2017	2016
Net sales	100.0 %	100.0 %	100.0 %
Cost of sales (exclusive of depreciation and amortization shown separately below)	76.3 %	74.1 %	73.3 %
Selling, general and administrative expense	12.1 %	12.0 %	11.0 %
Acquisition related costs excluded from selling, general and administrative expense	0.8 %	0.1 %	— %
Depreciation and amortization	9.2 %	8.5 %	8.7 %
Other operating (income) expense, net	0.8 %	0.1 %	0.1 %
Goodwill impairment	23.7 %	— %	— %
Restructuring and integration expense, net	0.3 %	0.1 %	1.0 %
Income (loss) from operations	(23.2)%	5.1 %	5.9 %
Interest expense	7.9 %	8.4 %	10.7 %
Loss on extinguishment of debt and write-off of debt issuance costs	2.5 %	6.8 %	0.4 %
Derivative payments on interest rate swap	— %	— %	0.1 %
Derivative loss (gain) on change in interest rate swap fair value	— %	— %	0.4 %
Other (income) expense, net	0.2 %	(0.3)%	(0.5)%
Loss from continuing operations before benefit for income taxes and share of net income from joint venture	(33.8)%	(9.8)%	(5.2)%
Benefit for income taxes	1.4 %	12.8 %	2.6 %
Share of net income (loss) from joint venture	(1.9)%	0.8 %	1.0 %
Income (loss) from continuing operations	(34.3)%	3.8 %	(1.6)%
Income from discontinued operations, net of tax (Note 2)	— %	22.2 %	2.8 %
Net income (loss)	(34.3)%	26.0 %	1.2 %

Sales Concentration

During 2018, sales to various U.S. and foreign divisions of our ten largest customers accounted for approximately 49% of our consolidated net sales. However, no customers individually accounted for more than 10% of our consolidated net sales for 2018. The loss of all or a substantial portion of sales to these customers would cause us to lose a substantial portion of our revenue and have a corresponding negative impact on our income from operations due to the operational leverage these customers provide. This could lead to sales volumes not being high enough to cover our current cost structure or to provide adequate operating cash flows or cause us to incur additional restructuring and/or impairment costs.

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Year Ended December 31, 2018, compared to the Year Ended December 31, 2017

	Year Ended December 31,			
	2018	2017	$ Change	
Net sales	$770,657	$619,793	$150,864	
Acquisitions				$152,952
Volume				7,320
Foreign exchange effects				(2,083)
Price/mix/inflation/other				(7,325)
Cost of sales (exclusive of depreciation and amortization shown separately below)	588,205	459,080	129,125	
Acquisitions				$112,774
Volume				5,785
Foreign exchange effects				(1,438)
Cost reduction projects				(7,501)
Inflation				9,599
Mix/other				9,906
Selling, general and administrative expense	93,583	74,112	19,471	
Acquisition related costs excluded from selling, general and administrative expense	5,871	344	5,527	
Depreciation and amortization	71,128	52,406	18,722	
Other operating (income) expense, net	6,089	351	5,738	
Goodwill impairment	182,542	—	182,542	
Restructuring and integration expense, net	2,127	386	1,741	
Income (loss) from operations	(178,888)	33,114	(212,002)	
Interest expense	61,243	52,085	9,158	
Loss on extinguishment of debt and write-off of debt issuance costs	19,562	42,087	(22,525)	
Derivative loss (gain) on change in interest rate swap fair value	—	(101)	101	
Other (income) expense, net	1,341	(2,084)	3,425	
Loss from continuing operations before benefit for income taxes and share of net income from joint venture	(261,034)	(58,873)	(202,161)	
Benefit for income taxes	10,957	79,026	(68,069)	
Share of net income (loss) from joint venture	(14,390)	5,211	(19,601)	
Income (loss) from continuing operations	(264,467)	25,364	(289,831)	
Income from discontinued operations, net of tax (Note 2)	—	137,688	(137,688)	
Net income (loss)	$(264,467)	$163,052	$(427,519)	

Net Sales. Net sales increased by $150.9 million, or 24%, in 2018 compared to 2017, primarily due to $153.0 million of net sales attributable to the 2018 acquisitions of Paragon Medical and Bridgemedica, and the fourth quarter 2017 acquisition of NN Vandalia, in our Life Sciences group and the Technical Arts business acquired in our Power Solutions group. Higher volumes contributed another $7.3 million to the increase primarily as a result of demand improvements within the automotive, life sciences, and electrical end markets. These increases were partially offset by unfavorable foreign exchange effects of $2.1 million.

Cost of Sales. The increase in cost of sales was primarily due to $112.8 million in cost of sales attributable to the Paragon Medical, Bridgemedica, NN Vandalia, and Technical Arts acquisitions. Higher volumes also contributed $5.8 million to the increase, consistent with the increase in sales demand. These volume increases were partially offset by favorable foreign exchange effects and $7.5 million in cost savings from production process improvement projects. Inflation and wage increases contributed $9.6 million to the increase in cost of sales.

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Selling, General and Administrative Expense. The majority of the increase in selling, general and administrative expense during the year ended December 31, 2018, compared to the year ended December 31, 2017, was due to the Paragon Medical, Bridgemedica, NN Vandalia, and Technical Arts businesses which collectively contributed $12.5 million to selling, general and administrative expense during the year ended December 31, 2018. Infrastructure and staffing costs incurred related to our strategic initiatives, including integration of recent acquisitions and a global implementation of an enterprise resource planning ("ERP") systems, also contributed to the increase. These increases were partially offset by lower incentive compensation expense in 2018 as compared to 2017.

Acquisition Related Costs Excluded from Selling, General and Administrative. Acquisition related costs are primarily third party legal, accounting, valuation consulting and investment banking advisory fees incurred in connection with the Life Sciences acquisitions.

Depreciation and Amortization. The increase in depreciation and amortization during the year ended December 31, 2018, compared to the year ended December 31, 2017, was consistent with additions to intangible assets and property, plant and equipment, including $16.1 million from the Paragon Medical, Bridgemedica, NN Vandalia, and Technical Arts businesses. This additional depreciation and amortization expense includes the effects of related fair value adjustments to certain property, plant and equipment and the addition of intangible assets, principally for customer relationships and trade names.

Other Operating (Income) Expense, Net. Other net operating expense in the year ended December 31, 2018, primarily resulted from impairment charges on property, plant and equipment of $5.2 million and a loss on the sale of property, plant and equipment of $0.6 million partially offset by a $0.7 million change in fair value of a contingent earnout liability associated with the Bridgemedica acquisition.

Goodwill Impairment. The increase in goodwill impairment in the year ended December 31, 2018 was the result of goodwill impairment charges at Mobile Solutions and Power Solutions. See Note 8 in the Notes to Consolidated Financial Statements for more information on the impairment charges.

Restructuring and Integration Expense. The increase in restructuring and integration expense was primarily due to employee severance costs incurred in connection with implementing our new enterprise and management structure. Note 13 in the Notes to Consolidated Financial Statements provides more information regarding the effects of restructuring and integration on our operating results.

Interest Expense. Interest expense increased by $9.2 million during the year ended December 31, 2018, compared to the year ended December 31, 2017, primarily due to interest on the Second Lien Facility, which was not in place during the year ended December 31, 2017, and bore interest at a higher rate than our existing credit facility. This increase was partially offset by the redemption of our 10.25% Senior Notes due 2020 (the "Senior Notes") on April 3, 2017, with the proceeds of our incremental term loan of an aggregate principal amount of $300.0 million (the "Incremental Term Loan"), which bears an interest rate based on the London Interbank Offered Rate ("LIBOR") plus an applicable margin of 3.25%, which is lower than the 10.25% fixed interest rate on the Senior Notes. Additionally, LIBOR was higher in the year ended December 31, 2018, compared to the year ended December 31, 2017.

	Year Ended December 31,	
	2018	2017
Interest on debt	$ 56,977	$ 47,681
Amortization of debt issuance costs	4,845	4,296
Interest on capital leases and other	624	1,189
Capitalized interest	(1,203)	(1,081)
Total interest expense	$ 61,243	$ 52,085

Loss on Extinguishment of Debt and Write-off of Unamortized Debt Issuance Costs. The decrease in the loss on extinguishment of debt and write-off of unamortized debt issuance costs is primarily due to the $42.1 million write off in 2017 as the result of the extinguishment of the Senior Notes and modification of our credit facility offset by the $12.9 million write off in 2018 related to the Second Lien Facility. Additionally, we paid a two percent, or $4.0 million, prepayment penalty and wrote off $2.6 million of unamortized original issue discount when we paid the Second Lien Facility in full in September 2018.

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Benefit for Income Taxes. Our effective tax rate from continuing operations was 4.2% for the year ended December 31, 2018, compared to 134.2% for the year ended December 31, 2017. Note 11 in the Notes to Condensed Consolidated Financial Statements describes the components of income taxes for each period presented.

Share of Net Income from Joint Venture. The impact on our earnings from a Chinese joint venture in our Mobile Solutions group decreased primarily due to a partial impairment of the investment in the joint venture of $16.6 million as well as a decrease in the Company's share of net income from the joint venture of $3.0 million. The joint venture's net income decreased primarily due to price and volume decreases resulting from reduced demand in the Chinese automotive market and increased raw material costs. See Note 10 in the Notes to Consolidated Financial Statements for more information on the impairment charge.

Results by Segment

MOBILE SOLUTIONS

	Year Ended December 31,			
	2018	2017	$ Change	
Net sales	$335,037	$336,852	$(1,815)	
Volume				$4,300
Foreign exchange effects				(1,327)
Price/mix/inflation/other				(4,788)
Goodwill impairment	(73,442)	—	(73,442)	
Income from operations	$(54,103)	$34,405	$(88,508)	

Net sales decreased in 2018 from 2017 due to price reductions granted to our customers and the negative impact of shifts in foreign currency exchange rates during 2018. These effects were substantially offset by the benefit derived from our steering systems customers increasing their market share as the industry shifts from hydraulics to electric-assist steering systems technologies. Also, as the Brazilian economy improves, demand for automotive products improved during 2018.

Income from operations decreased by $88.5 million compared to prior year primarily due to an impairment loss on goodwill of $73.4 million, which was recognized in the Consolidated Statements of Operations and Comprehensive Income (Loss) during the fourth quarter of 2018. In addition, the decrease was due to higher start-up costs related to new product launches, lower customer pricing as noted above, and higher depreciation expense due to capital investments to support new product launches. These factors were partially offset by implementation of cost savings initiatives and the beneficial impact of higher production volumes.

POWER SOLUTIONS

	Year Ended December 31,			
	2018	2017	$ Change	
Net sales	$189,778	$186,602	$3,176	
Acquisitions				$2,521
Volume				2,893
Foreign exchange effects				(756)
Price/mix/inflation/other				(1,482)
Goodwill impairment	(109,100)	—	(109,100)	
Income from operations	$(95,115)	$23,440	$(118,555)	

Net sales increased in 2018 from 2017 primarily due to growth in sales to customers in the electrical products end market. Sales from the Technical Arts business contributed $2.5 million to the current year.

Income from operations decreased by $118.6 million primarily due to an impairment loss on goodwill of $109.1 million recognized in the Consolidated Statements of Operations and Comprehensive Income (Loss) during the fourth quarter of 2018 as well as a shift in product mix toward higher cost raw materials, such as precious metals used in

power control products, and investments in the development of new products and manufacturing facilities to support growth in the aerospace end market.

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LIFE SCIENCES

	Year Ended December 31,			
	2018	2017	$ Change	
Net sales	$248,173	$98,329	$149,844	
Acquisitions				$150,431
Volume				127
Foreign exchange effects				—
Price/mix/inflation/other				(714)
Goodwill impairment	—	—	—	
Income from operations	$19,136	$13,271	$5,865	

Net sales increased during the year ended December 31, 2018, from the year ended December 31, 2017, primarily due to $150.4 million of net sales attributable to the 2018 acquisitions of Paragon Medical and Bridgemedica, and a full year of activity from the 2017 acquisition of NN Vandalia, as well as a $0.1 million increase in core volume.

Income from operations increased by $5.9 million primarily due to $10.7 million contributed by the Paragon Medical, Bridgemedica, and NN Vandalia acquisitions. This increase was partially offset by $2.6 million of increased operating expenses and $1.3 million of acquisition related restructuring and integration costs and other costs associated with establishing the Life Sciences Group.

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Year Ended December 31, 2017, compared to the Year Ended December 31, 2016

	Year Ended December 31,			
	2017	2016	$ Change	
Net sales	$619,793	$584,954	$34,839	
Acquisitions				$6,682
Volume				25,944
Foreign exchange effects				1,956
Price/mix/inflation/other				257
Cost of sales (exclusive of depreciation and amortization shown separately below)	459,080	428,843	30,237	
Acquisitions				$6,204
Volume				17,704
Foreign exchange effects				1,796
Cost reduction projects				(3,150)
Inflation				2,506
Mix/other				5,177
Selling, general and administrative expense	74,112	64,144	9,968	
Acquisition related costs excluded from selling, general and administrative expense	344	—	344	
Depreciation and amortization	52,406	50,721	1,685	
Loss (gain) on disposal of assets	351	809	(458)	
Restructuring and integration expense	386	5,658	(5,272)	
Income from operations	33,114	34,779	(1,665)	
Interest expense	52,085	62,870	(10,785)	
Loss on extinguishment of debt and write-off of unamortized debt issuance costs	42,087	2,589	39,498	
Derivative payments on interest rate swap	—	609	(609)	
Derivative loss (gain) on change in interest rate swap fair value	(101)	2,448	(2,549)	
Other (income) expense, net	(2,084)	(2,871)	787	
Loss from continuing operations before benefit for income taxes and share of net income from joint venture	(58,873)	(30,866)	(28,007)	
Benefit for income taxes	79,026	15,438	63,588	
Share of net income from joint venture	5,211	5,938	(727)	
Income (loss) from continuing operations	25,364	(9,490)	34,854	
Income from discontinued operations, net of tax	137,688	16,153	121,535	
Net income	$163,052	$6,663	$156,389	

Net Sales. Net sales increased by $34.8 million, or 6.0%, in 2017 compared to 2016 primarily due to increased volumes. The higher volumes were primarily due to demand improvements within the life sciences end market, the automotive end market, and the general industrial end market. Additionally, sales from the NN Vandalia business that we acquired on October 2, 2017, contributed $6.7 million to 2017 sales. Appreciation of the Chinese renminbi and the euro in relation to the U.S. dollar in 2017 also increased net sales year over year.

Cost of Sales. The increase in cost of sales was primarily due to the increase in demand and production volumes as well as changes in product mix and start-up costs for certain new products. Cost of sales for NN Vandalia contributed $6.2 million to the 2017 increase, which includes a one-time $0.9 million impact to cost of sales related to inventory valuation as part of purchase accounting. Increases were partially offset by cost savings from production process improvement projects.

Selling, General and Administrative Expense. The increase in selling, general and administrative expense during 2017 compared to 2016 was primarily due to infrastructure and staffing costs incurred related to our strategic initiatives,

including a global implementation of an enterprise resource planning (“ERP”) system.

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Acquisition Related Costs Excluded from Selling, General and Administrative. Acquisition related costs are primarily third party legal, accounting, valuation consulting, and investment banking advisory fees incurred directly related to the NN Vandalia acquisition in 2017.

Depreciation and Amortization. The increase in depreciation and amortization in 2017 was primarily due to additions to property, plant and equipment. The increase was partially offset by a decrease of $2.5 million related to amortization in 2016 of backlog and unfavorable leasehold intangible assets acquired with the PEP Acquisition. These intangible assets became fully amortized in the first quarter of 2016. The NN Vandalia acquisition contributed $0.6 million of depreciation and amortization expense to 2017. The NN Vandalia depreciation and amortization includes the related step-ups of certain property, plant and equipment to fair value and the addition of intangible assets principally for customer relationships and trade names.

Restructuring and Integration Expense. The decrease in restructuring and integration expense was primarily due to limited spending on site closure costs in 2017 compared to $4.3 million of cost incurred in 2016 to close a plant in Wheeling, Illinois, in our Autocam Precision Components Group.

Interest Expense. Interest expense decreased by $10.8 million in 2017 due to the redemption of the Senior Notes on April 3, 2017, with the proceeds of the Incremental Term Loan, which bears a lower interest rate based on LIBOR. Further interest savings resulted from the refinancing of the Senior Secured Term Loan and Senior Secured Revolver in the third quarter of 2016 and further refinancing of the Senior Secured Term Loan and the Incremental Term Loan on November 24, 2017.

	Year Ended December 31,	
	2017	2016
Interest on debt	$ 47,681	$ 57,519
Interest rate swaps settlements	—	1,393
Amortization of debt issuance costs	4,296	4,168
Interest on capital leases and other	1,189	1,379
Capitalized interest	(1,081)	(1,589)
Total interest expense	$ 52,085	$ 62,870

Loss on Extinguishment of Debt and Write-off of Unamortized Debt Issuance Costs. The increase in loss on extinguishment of debt and write-off of unamortized debt issuance costs is primarily due to the $42.1 million write off in 2017 as a result of the extinguishment of the Senior Notes and modification and subsequent refinancing of our credit facility offset by the $2.6 million write off in 2016 related to debt restructurings that occurred during 2016.

Derivative Loss (Gain) on Change in Interest Rate Swap Fair Value. During the third quarter of 2016, we chose to discontinue hedge accounting. As a result, all amounts of accumulated other comprehensive income were reclassified to earnings.

Benefit for Income Taxes. Our effective tax rate from continuing operations was 134.2% in 2017 compared to 50.0% for 2016. Note 11 in the Notes to Consolidated Financial Statements describes the components of income taxes for each period presented.

Income from Continuing Operations. Benefit for income taxes increased by $63.6 million primarily as a result of the U.S. Tax Cuts and Jobs Act of 2017. Income from operations of $33.1 million for 2017 was more than offset by the loss on extinguishment of debt and write-off of unamortized debt issuance cost and interest expense. Also, acquisition related costs accounted for a $0.3 million reduction in income from operations as compared to 2016. The $10.8 million reduction in interest expense also contributed to income from continuing operations. Significant components of the changes in income from operations and interest expense were presented in the preceding paragraphs.

Income from Discontinued Operations, Net of Tax. The largest component of income from discontinued operations in 2017 was the $127.7 million gain on sale of our PBC Business, net of tax. Note 2 in the Notes to Consolidated Financial Statements provides details of the results of discontinued operations.

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Results by Segment
MOBILE SOLUTIONS

	Year Ended December 31,			
	2017	2016	$ Change	
Net sales	$336,852	$326,138	$10,714	
Volume				$9,963
Foreign exchange effects				2,213
Price/mix/inflation/other				(1,462)
Income from operations	34,405	29,490	4,915	

Net sales increased in 2017 from 2016 due to industrial market demand improvements in the US and China and new automotive program launches in the US, China and Brazil. We are realizing the indirect benefits of our customers taking an increasing portion of market share. Also, as the Brazilian economy rebounds, demand for automotive products is increasing.
The increase in net sales contributed to the increase in income from operations. Cost reduction projects resulted in savings in cost of sales of approximately $1.6 million in 2017 compared to 2016. Restructuring costs decreased by $4.0 million, primarily related to the closure of a plant in Wheeling, Illinois. These factors that increased income from operations were slightly offset by start-up costs for new products and a $2.3 million increase in depreciation and amortization consistent with recent capital expenditure activity.
POWER SOLUTIONS

	Year Ended December 31,			
	2017	2016	$ Change	
Net sales	$186,602	$180,330	$6,272	
Acquisitions				$ —
Volume				5,759
Foreign exchange effects				(257)
Price/mix/inflation/other				770
Income from operations	23,440	24,060	(620)	

Net sales increased in 2017 from 2016 primarily due to the overall improvement in demand across the power solutions end market and sales to new customers within the aerospace and defense market. We have also benefited from the introduction of new products for the aerospace and defense end market.

Income from operations decreased by $0.6 million primarily due to a shift in product mix toward higher cost raw materials and new program setup costs for certain products sold into the aerospace and defense end market.

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LIFE SCIENCES

	Year Ended December 31,			
	2017	2016	$ Change	
Net sales	$98,329	$80,057	$18,272	
Acquisitions				$6,682
Volume				10,222
Foreign exchange effects				—
Price/mix/inflation/other				1,368
Income from operations	13,271	9,840	3,431	

Net sales increased in 2017 from 2016 primarily due to the overall improvement in demand across the life sciences end market and increases in market share for certain medical devices. Sales from the NN Vandalia business acquired on October 2, 2017, contributed $6.7 million to 2017 sales.

Income from operations increased by $3.4 million primarily due to the increase in sales associated with the acquisition of NN Vandalia on October 2, 2017 offset by increase in operating expenses.

Changes in Financial Condition from December 31, 2017, to December 31, 2018

From December 31, 2017, to December 31, 2018, total assets increased by $26.6 million primarily due to assets acquired with the Paragon Medical, Bridgemedica, and Technical Arts businesses which had $475.6 million of total assets as of December 31, 2018. Paragon Medical, Bridgemedica, and Technical Arts contributed $172.7 million to goodwill and $171.1 million to intangible assets. Overall, accounts receivable increased consistently with sales growth. Inventories increased as our plants satisfy customer demand. Days inventory outstanding increased by approximately 4 days as our businesses ramp up manufacturing activity to meet expected customer demand on a timely basis and due to managing procurement based on market price projections. Partially offsetting these increases was a $206.5 million decrease in cash to fund the Paragon Medical and Bridgemedica acquisitions as well as impairment of goodwill at Mobile Solutions and Power Solutions of $73.4 million and $109.1 million, respectively.