

# **ARMSTRONG WORLD INDUSTRIES, INC.**

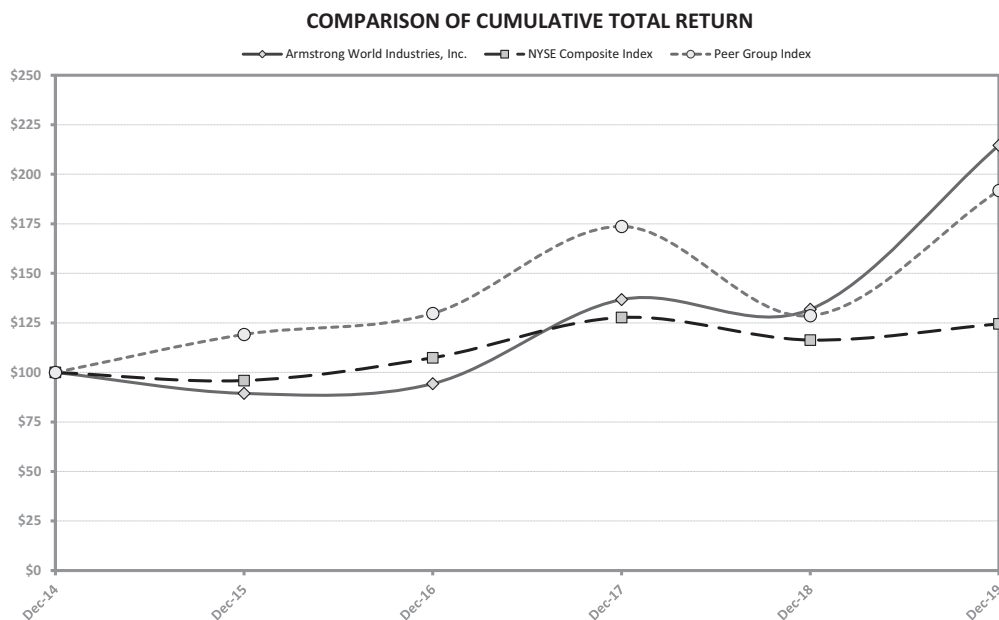
## **2019 ANNUAL REPORT**



Armstrong World Industries, Inc.  
P. O. Box 3001  
Lancaster, PA 17604-3001  
[www.armstrongceilings.com](http://www.armstrongceilings.com)

## SHARE PERFORMANCE GRAPH

The following graph shows the cumulative total shareholder return for Armstrong World Industries, Inc. Common Shares (NYSE: AWI) during the period from December 31, 2014 to December 31, 2019. The graph also shows the cumulative returns of the NYSE Composite Index and a building materials peer group composed of the companies listed below the chart. The performance shown in the chart should not be considered indicative of future performance.



ASSUMES \$100 INVESTED ON DEC 31, 2014  
ASSUMES DIVIDENDS REINVESTED  
FISCAL YEAR ENDING DEC. 31, 2019

### Comparison of cumulative total return of one or more companies, peer groups, industry indexes, and/or broad markets

Company/Market/Peer Group	Period Ending					
	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
Armstrong World Industries, Inc.	\$100.00	\$89.40	\$94.32	\$136.76	\$131.84	\$214.61
NYSE Composite Index	\$100.00	\$95.90	\$107.41	\$127.71	\$116.34	\$124.47
Peer Group Index	\$100.00	\$119.17	\$129.78	\$173.66	\$128.63	\$191.87

### The client-selected peer group is composed of the following companies:

(Market Cap is the base year)

	% of Total Market Cap
Acuity Brands Inc	6%
Allegion PLC	6%
A.O. Smith Corp	6%
Apogee Enterprises	1%
Continental Building Products Inc	1%
Fortune Brands	8%
Interface Inc	1%
James Hardie Industries PLC	7%
Masco Corp	10%
Masonite International Corp	2%
Mohawk Industries Inc	13%
Owens Corning	5%
Simpson Manufacturing	2%
Sherwin-Williams	28%
Lennox International Inc	5%
NCI Building Systems Inc	2%
	<b>100%</b>

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549  
FORM 10-K**

(Mark One)

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

For the fiscal year ended December 31, 2019

OR

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

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission File Number 1-2116

**ARMSTRONG WORLD INDUSTRIES, INC.**

(Exact name of registrant as specified in its charter)

Pennsylvania

(State or other jurisdiction of  
incorporation or organization)

2500 Columbia Avenue, Lancaster, Pennsylvania

(Address of principal executive offices)

23-0366390

(I.R.S. Employer  
Identification No.)

17603

(Zip Code)

Registrant's telephone number, including area code (717) 397-0611

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, \$0.01 par value per share	AWI	New York Stock Exchange

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

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

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

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

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

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

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
Emerging growth company	<input type="checkbox"/>		

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

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

The aggregate market value of the Common Stock of Armstrong World Industries, Inc. held by non-affiliates based on the closing price (\$97.20 per share) on the New York Stock Exchange (trading symbol AWI) as of June 28, 2019 was approximately \$4.7 billion. As of February 18, 2020, the number of shares outstanding of the registrant's Common Stock was 47,987,627.

**Documents Incorporated by Reference**

Certain sections of Armstrong World Industries, Inc.'s definitive Proxy Statement for use in connection with its 2020 annual meeting of shareholders, to be filed no later than April 29, 2020 (120 days after the last day of our 2019 fiscal year), are incorporated by reference into Part III of this Form 10-K Report where indicated.

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When we refer to “AWI,” the “Company,” “we,” “our” and “us”, we are referring to Armstrong World Industries, Inc. and its subsidiaries.

### CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements in this Annual Report on Form 10-K and the documents incorporated by reference may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Those forward-looking statements are subject to various risks and uncertainties and include all statements that are not historical statements of fact and those regarding our intent, belief or expectations, including, but not limited to, our expectations concerning our residential and commercial markets and their effect on our operating results; our expectations regarding the payment of dividends; and our ability to increase revenues, earnings and earnings before interest, taxes, depreciation and amortization (as discussed below). Words such as “anticipate,” “expect,” “intend,” “plan,” “target,” “project,” “predict,” “believe,” “may,” “will,” “would,” “could,” “should,” “seek,” “estimate” and similar expressions are intended to identify such forward-looking statements. These statements are based on management’s current expectations and beliefs and are subject to a number of factors that could lead to actual results materially different from those described in the forward-looking statements. Although we believe that the assumptions underlying the forward-looking statements are reasonable, we can give no assurance that our expectations will be attained. Factors that could have a material adverse effect on our financial condition, liquidity, results of operations or future prospects or which could cause actual results to differ materially from our expectations include, but are not limited to:

- economic conditions;
- construction activity;
- competition;
- key customers;
- customer consolidation;
- availability and costs of raw materials and energy;
- Worthington Armstrong Venture (“WAVE”), our joint venture with Worthington Industries, Inc;
- geographic concentration;
- strategic transactions;
- negative tax consequences;
- environmental matters;
- information technology disruptions and cybersecurity breaches;
- claims;
- litigation;
- digitalization initiatives and new technology;
- covenants in our debt agreements;
- our indebtedness;
- our liquidity;
- defined benefit plan obligations;
- intellectual property rights;
- sustainability;
- the tax consequences of the separation of our flooring business from our ceilings business;
- international operations;
- costs savings and productivity initiatives;
- labor;
- dividend payments; and
- other risks detailed from time to time in our filings with the Securities and Exchange Commission (the “SEC”), press releases and other communications, including those set forth under “Risk Factors” included elsewhere in this Annual Report on Form 10-K.

Such forward-looking statements speak only as of the date they are made. We expressly disclaim any obligation to release publicly any updates or revisions to any forward-looking statements to reflect any change in our expectations with regard thereto or change in events, conditions or circumstances on which any statement is based.

## PART I

### ITEM 1. BUSINESS

Armstrong World Industries, Inc. (“AWI” or the “Company”) is a Pennsylvania corporation incorporated in 1891. When we refer to “we,” “our” and “us” in this report, we are referring to AWI and its subsidiaries.

We are a leading producer of ceiling systems for use in the construction and renovation of commercial and residential buildings. We design, manufacture and sell ceiling and wall systems (primarily mineral fiber, fiberglass wool, metal, wood, wood fiber, glass-reinforced-gypsum and felt) throughout the Americas.

#### Acquisitions

In November 2019, we acquired the business and assets of MRK Industries, Inc. (“MRK”), based in Libertyville, Illinois. MRK is a manufacturer of specialty metal ceiling, wall and exterior solutions with one manufacturing facility. MRK’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In March 2019, we acquired the business and assets of Architectural Components Group, Inc. (“ACGI”), based in Marshfield, Missouri. ACGI is a manufacturer of custom wood ceilings and walls with one manufacturing facility. ACGI’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In August 2018, we acquired the business and assets of Steel Ceilings, Inc. (“Steel Ceilings”), based in Johnstown, Ohio. Steel Ceilings is a manufacturer of aluminum and stainless metal ceilings that include architectural, radiant and security solutions with one manufacturing facility. Steel Ceilings’ operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In May 2018, we acquired the business and assets of Plasterform, Inc. (“Plasterform”), based in Mississauga, Ontario, Canada. Plasterform is a manufacturer of architectural cast ceilings, walls, facades, columns and moldings with one manufacturing facility. Plasterform’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In January 2017, we acquired the business and assets of Tectum, Inc. (“Tectum”), based in Newark, Ohio. Tectum is a manufacturer of acoustical ceiling, wall and structural solutions for commercial building applications with two manufacturing facilities. Tectum’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

#### Discontinued Operations

On September 30, 2019, we completed the previously announced sale of certain subsidiaries comprising our businesses and operations in Europe, the Middle East and Africa (including Russia) (“EMEA”) and the Pacific Rim, including the corresponding businesses and operations conducted by Worthington Armstrong Venture (“WAVE”), our joint venture with Worthington Industries, Inc. (“Worthington”) in which AWI holds a 50% interest (collectively, the “Sale”), to Knauf International GmbH (“Knauf”). The purchase price of \$330.0 million was previously paid by Knauf to us during the third quarter of 2018 and is subject to certain post-closing adjustments for cash and debt as provided in the Share Purchase Agreement dated as of November 17, 2017, by and between us and Knauf (the “Purchase Agreement”), including adjustments based on the economic impact of any required regulatory remedies and a working capital adjustment.

On July 18, 2018, we entered into an amendment to the Purchase Agreement, pursuant to which Knauf irrevocably and unconditionally paid AWI (i) \$250.0 million of the purchase price on August 1, 2018, and (ii) \$80.0 million of the purchase price on September 15, 2018, which payments were credited against the aggregate consideration payable at closing. The amendment also provided for the reduction (from a maximum of \$35.0 million to a maximum of \$20.0 million) of potential adjustments to the purchase price consideration for the transaction based on the impact of remedies required to satisfy competition conditions. Following receipt of these payments, we remitted \$70.0 million to WAVE in partial consideration of the purchase price payable in respect of the businesses and operations of WAVE under the transaction. WAVE subsequently paid each of AWI and Worthington a dividend of \$35.0 million. We have recorded a \$25.9 million payable to WAVE for their remaining portion of the proceeds from Knauf, which is reflected within Accounts payable and accrued expenses in the Consolidated Balance Sheets as of December 31, 2019. The transaction and final gain or loss amounts are subject to finalization of customary working capital and other adjustments, as provided in the Purchase Agreement. For the year ended December 31, 2019, payments to Knauf included \$61.0 million of adjustments to cash consideration, estimated working capital adjustments and remedies, offset by \$13.1 million of additional cash in international WAVE entities.

On December 7, 2018, the European Commission granted conditional clearance of the transaction, subject to certain commitments intended to address concerns regarding the overlap between the activities of AWI and Knauf, including the divestment by Knauf to a

third party of certain mineral fiber and grid businesses and operations in Austria, Estonia, Germany, Ireland, Italy, Latvia, Lithuania, Portugal, Spain, Turkey and the United Kingdom (“UK”). This included our sales operations in each of the relevant countries, as well as our production facilities, and those of WAVE, located in Team Valley, UK.

On May 23, 2019, we entered into a Transition Services Agreement with Knauf for its benefit and the benefit of the buyer of the divestment business, pursuant to which we are providing certain transition technology, finance and information technology support services during the period between March 18, 2019 and September 30, 2020.

On September 23, 2019, the European Commission approved the Sale, as well as the terms of the sale of the divestment business by Knauf and the identity of the purchaser.

In connection with the closing of the Sale, we also entered into (i) an intellectual property License Agreement with Knauf for its benefit (and, under sublicense, to the buyer of the divestment business) under which they license certain patents, trademarks and know-how from us for use in certain licensed territories, and (ii) a Supply Agreement with Knauf under which the parties may continue to purchase certain products from each other following the closing of the Sale. WAVE also entered into similar agreements with Knauf for such purposes.

The EMEA and Pacific Rim segment historical financial results through September 30, 2019 have been reflected in AWI’s Consolidated Statements of Earnings and Comprehensive Income as discontinued operations for all periods presented, while the assets and liabilities of discontinued operations have been removed from AWI’s Consolidated Balance Sheet as of December 31, 2019.

See Notes 5 and 6 to the Consolidated Financial Statements for additional information related to our acquisitions and discontinued operations.

We are focused on driving sustainable shareholder value by consistently delivering profitable sales and earnings growth, while maintaining a balanced approach to capital allocation. Through our expanding architectural specialties offerings, bolstered by our acquisitions of Tectum, Plasterform, Steel Ceilings, ACGI and MRK, our innovative core ceilings portfolio, including our Total Acoustics® solutions and Sustain® family of products, and digitally enabled systems and tools, we are expanding our capabilities to sell into more spaces and sell more into every space.

## **Markets**

We are well positioned in the industry sectors and categories in which we operate, often holding a leadership position. Our products compete against mineral fiber and fiberglass products from other manufacturers, as well as drywall and a wide range of specialty ceiling products. We compete directly with other domestic and international suppliers of these products. The major markets in which we compete are:

*Commercial Construction.* Our revenue opportunities come from new construction as well as renovation of existing buildings. Renovation work (also known as replacement/remodel) is estimated to represent the majority of the commercial market opportunity. Most of our revenue comes from the following sectors of commercial construction – office, education, transportation, healthcare, government and retail. We monitor U.S. construction starts and project activity. Our revenue from new construction can lag behind construction starts by as much as 18 to 24 months. We also monitor office vacancy rates, the Architecture Billings Index, state and local government spending, gross domestic product (“GDP”) and general employment levels, which can indicate movement in renovation and new construction opportunities. We believe that these statistics, taking into account the time-lag effect, provide a reasonable indication of our future revenue opportunity from commercial renovation and new construction. Additionally, we believe that customer preferences for product type, style, color, performance attributes (such as acoustics and sustainability), availability, affordability and ease of installation also affect our revenue.

In our Mineral Fiber segment, we estimate that a majority of our commercial market sales are used for renovation purposes by end-users of our products. In our Architectural Specialties segment, we estimate that a majority of our commercial market sales are used for new construction and remodel purposes by end-users of our products. The end-use of our products is based on management estimates as such information is not easily determinable.

*Residential Construction.* We also sell mineral fiber products for use in single and multi-family housing. We estimate that existing home renovation work represents the majority of the residential market opportunity. Key U.S. statistics that indicate market opportunity include existing home sales (a key indicator for renovation opportunity), housing starts, housing completions, home prices, interest rates and consumer confidence.

## **Customers**

We use our reputation, capabilities, service, innovation and brand recognition to develop long-standing relationships with our customers. We principally sell commercial products to building materials distributors, who re-sell our products to contractors, subcontractors' alliances, large architect and design firms, and major facility owners. We have important relationships with national home centers such as Lowe's Companies, Inc. and The Home Depot, Inc., with wholesalers who re-sell our products to dealers who service builders, contractors and consumers, and also with architects and designers who specify products.

Approximately 73% of our consolidated net sales are to distributors. Sales to large home centers account for slightly less than 10% of our consolidated net sales. Our remaining sales are primarily to direct customers and retailers.

Gross sales to two commercial distributors totaling \$428.7 million, included within our Mineral Fiber and Architectural Specialties segments, individually exceeded 10% of our consolidated gross sales in 2019.

## **Working Capital**

We produce goods for inventory and sell on credit to our customers. Generally, our distributors carry inventory as needed to meet local or rapid delivery requirements. We sell our products to select, pre-approved customers using customary trade terms that allow for payment in the future. These practices are typical within the industry.

## **Competition**

The markets in which our products are sold are highly competitive. Principal attributes of competition include product performance, product styling, service and price. Competition comes from both domestic and international manufacturers. Additionally, some of our products compete with alternative products or finishing solutions, namely, drywall and exposed structure (also known as open plenum). Excess industry capacity exists for certain products, which tends to increase price competition. The following companies are our primary competitors:

CertainTeed Corporation (a subsidiary of Saint-Gobain), Chicago Metallic Corporation (owned by Rockwool International A/S), Georgia-Pacific Corporation, Rockfon A/S (owned by Rockwool International A/S), USG Corporation (owned by Gebr. Knauf KG), Ceilings Plus (owned by USG Corporation), Rulon International, and 9Wood.

## **Raw Materials**

We purchase raw materials from numerous suppliers worldwide in the ordinary course of business. The principal raw materials include: clays, fiberglass, perlite, pigment, starch, waste paper, wood and wood fiber. We manufacture most of the production needs for mineral wool at one of our manufacturing facilities. Finally, we use aluminum and steel in the production of metal ceilings by us and by WAVE, our joint venture that manufactures ceiling grid.

We also purchase significant amounts of packaging materials and consume substantial amounts of energy, such as electricity and natural gas, and water.

In general, adequate supplies of raw materials are available to all of our operations. However, availability can change for a number of reasons, including environmental conditions, laws and regulations, shifts in demand by other industries competing for the same materials, transportation disruptions and/or business decisions made by, or events that affect, our suppliers. There is no assurance that these raw materials will remain in adequate supply to us.

Prices for certain high usage raw materials can fluctuate dramatically. Cost increases for these materials can have a significant adverse impact on our manufacturing costs. Given the competitiveness of our markets, we may not be able to recover the increased manufacturing costs through increasing selling prices to our customers.

## **Sourced Products**

Some of the products that we sell are sourced from third parties. Our primary sourced products include specialty ceiling products. We purchase some of our sourced products from suppliers that are located outside of the U.S., primarily from Europe and the Pacific Rim. Sales of sourced products represented approximately 12% of our total consolidated revenue in 2019.

In general, we believe we have adequate supplies of sourced products. However, we cannot guarantee that the supply will remain adequate.




## **Seasonality**

Generally, our sales tend to be stronger in the second and third quarters of our fiscal year due to more favorable weather conditions, customer business cycles and the timing of renovation and new construction.

## **Patent and Intellectual Property Rights**

Patent protection is important to our business. Our competitive position has been enhanced by patents on products and processes developed or perfected within AWI or obtained through acquisitions and licenses. In addition, we benefit from our trade secrets for certain products and processes.

Patent protection extends for varying periods according to the date of patent filing or grant and the legal term of a patent in the various countries where patent protection is obtained. The actual protection afforded by a patent, which can vary from country to country, depends upon the type of patent, the scope of its coverage and the availability of legal remedies. Although we consider that, in the aggregate, our patents, licenses and trade secrets constitute a valuable asset of material importance to our business, we do not believe we are materially dependent upon any single patent or trade secret, or any group of related patents or trade secrets.

Certain of our trademarks, including without limitation, , Armstrong®, ACOUSTIBuilt™, Airtite™, Calla®, Cirrus®, Cortega®, DESIGNFlex™, Dune™, Feltworks®, Humiguard®, Infusions®, InvisAcoustics™, Lyra®, MetalWorks™, Optima®, Plasterform™, Soundscapes®, Sustain®, Tectum®, Total Acoustics®, Ultima®, and WoodWorks®, are important to our business because of their significant brand name recognition. Registrations are generally for fixed, but renewable, terms.

In connection with the separation and distribution of our former flooring business into a separate publicly-traded company, Armstrong Flooring, Inc. (“AFI”), in 2016, we entered into several agreements with AFI that, together with a plan of division, provided for the separation and allocation of assets between AWI and AFI. These agreements include a Trademark License Agreement and a Transition Trademark License Agreement. Pursuant to the Trademark License Agreement, AWI provided AFI with a perpetual, royalty-free license to utilize the “Armstrong” trade name and logo. Pursuant to the Transition Trademark License Agreement, AFI provided us with a five-year royalty-free license to utilize the “Inspiring Great Spaces” tagline, logo and related color scheme.

In connection with the closing of the Sale, we entered into an intellectual property License Agreement with Knauf for its benefit (and, under sublicense, to the buyer of the divestment business) under which they license certain patents, trademarks and know-how from us for use in certain licensed territories.

We review the carrying value of trademarks at least annually for potential impairment. See the “Critical Accounting Estimates” section of Management’s Discussion and Analysis of Financial Condition and Results of Operations in Item 7 of this Form 10-K for further information.

## **Employees**

As of December 31, 2019, we had approximately 2,500 full time and part time employees. As of December 31, 2018, we had approximately 4,000 full-time and part-time employees, including 1,800 employees as part of our EMEA and Pacific Rim businesses. These employees were retained by Knauf and/or the buyer of the divestment business as a result of the Sale. The increase in employees, after taking into account the attrition from the Sale, is primarily attributable to the acquisitions of ACGI and MRK during 2019.

As of December 31, 2019, approximately 62% of our approximately 1,300 production employees in the U.S. were represented by labor unions. A collective bargaining agreement covering approximately 230 employees at one U.S. plant will expire during 2020. We believe that our relations with our employees are satisfactory.

## **Research & Development**

Research and development (“R&D”) activities are important and necessary in helping us improve our products’ competitiveness. Principal R&D functions include the development and improvement of products and manufacturing processes.

## **Sustainability and Environmental Matters**

The adoption of environmentally responsible building codes and standards such as the Leadership in Energy and Environmental Design (“LEED”) rating system established by the U.S. Green Building Council, has the potential to increase demand for products, systems and services that contribute to building sustainable spaces. Many of our products meet the requirements for the award of

LEED credits, and we are continuing to develop new products, systems and services to address market demand for products that enable construction of buildings that require fewer natural resources to build, operate and maintain. Our competitors also have developed and introduced to the market products with an increased focus on sustainability.

We expect that there will be increased demand over time for products, systems and services that meet evolving regulatory and customer sustainability standards and preferences and decreased demand for products that produce significant greenhouse gas emissions. We also believe that our ability to continue to provide these products, systems and services to our customers will be necessary to maintain our competitive position in the marketplace. We are committed to complying with all environmental laws and regulations that are applicable to our operations.

As a leading building products manufacturer, we are committed to operating as a strong corporate citizen across all areas of our business. This commitment is reflected in our ongoing initiatives to design and develop sustainable ceiling and wall products and solutions for every space.

### **Legal and Regulatory Proceedings**

Regulatory activities of particular importance to our operations include proceedings under the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”), and state Superfund and similar type environmental laws governing existing or potential environmental contamination at three domestically owned locations allegedly resulting from past industrial activity. We are one of several potentially responsible parties in these matters and have agreed to jointly fund required investigation, while preserving our defenses to the liability. We may also have rights of contribution or reimbursement from other parties or coverage under applicable insurance policies.

Most of our facilities are affected by various federal, state and local environmental requirements relating to the discharge of materials or the protection of the environment. We make expenditures necessary for compliance with applicable environmental requirements at each of our operating facilities. We have not experienced a material adverse effect upon our capital expenditures or competitive position as a result of environmental control legislation and regulations.

On September 8, 2017, Roxul USA, Inc. (d/b/a Rockfon) (“Rockfon”) filed litigation against us in the United States District Court for the District of Delaware (the “Court”) alleging anticompetitive conduct seeking remedial measures and unspecified damages. Roxul USA, Inc. is a significant ceilings systems competitor with global headquarters in Europe and expanding operations in the Americas. On April 3, 2019, we entered into a confidential settlement agreement with Rockfon to fully resolve the litigation between us, and Rockfon filed a Stipulation of Dismissal with Prejudice (“Dismissal”) with the Court. Pursuant to the Dismissal, Rockfon formally dismissed all claims it had against AWI with prejudice. All claims in the litigation have been fully and finally dismissed and released with AWI making a payment to Rockfon for its costs, expenses and attorneys’ fees. Pursuant to the settlement, both parties acknowledged that (a) AWI denies all claims of wrongdoing and makes no admission of wrongdoing or of the truth of any of the claims or allegations contained in Rockfon’s complaint or otherwise alleged in the litigation; (b) all AWI exclusive distribution locations (i.e., any location where a reseller has agreed to sell only AWI ceiling system products) will remain exclusive to AWI under their respective distribution agreements, and (c) in all other non-exclusive or “open” distribution locations, resellers are free to purchase and resell ceiling systems products of any manufacturer at their discretion. During 2019, we incurred \$19.7 million of expenses in connection with the matter, primarily relating to legal and professional fees incurred by us in connection with the litigation, including expenses and attorney’s fees paid under the settlement agreement. As a result of the settlement and Dismissal, we do not expect to incur additional future costs or expenses relating to the matter.

We are involved in various other lawsuits, claims, investigations and other legal matters from time to time that arise in the ordinary course of business, including matters involving our products, intellectual property, relationships with suppliers, relationships with distributors, relationships with competitors, employees and other matters. From time to time, for example, we may be a party to various litigation matters that involve product liability, tort liability and other claims under various allegations, including illness due to exposure to certain chemicals used in the workplace, or medical conditions arising from exposure to product ingredients or the presence of trace contaminants. Such allegations may involve multiple defendants and relate to legacy products that we and other defendants purportedly manufactured or sold. We believe that any current claims are without merit and intend to defend them vigorously. For these matters, we also may have rights of contribution or reimbursement from other parties or coverage under applicable insurance policies. When applicable and appropriate, we will pursue coverage and recoveries under those policies, but are unable to predict the outcome of those demands. While complete assurance cannot be given to the outcome of these proceedings, we do not believe that any current claims, individually or in the aggregate, will have a material adverse effect on our financial condition, liquidity or results of operations.

Liabilities of \$1.6 million and \$12.4 million as of December 31, 2019 and December 31, 2018, respectively, were recorded for environmental liabilities that we consider probable and for which a reasonable estimate of the probable liability could be made. See

Note 27 to the Consolidated Financial Statements and Risk Factors in Item 1A of this Form 10-K, for information regarding the possible effects that compliance with environmental laws and regulations may have on our businesses and operating results.

## **Website**

We maintain a website at <http://www.armstrongceilings.com>. Information contained on our website is not incorporated into this document. Annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, all amendments to those reports and other information about us are available free of charge through this website as soon as reasonably practicable after the reports are electronically filed with the SEC. Reference in this Form 10-K to our website and the SEC's website is an inactive text reference only.

## **ITEM 1A. RISK FACTORS**

### ***Unstable market and economic conditions could have a material adverse impact on our financial condition, liquidity or results of operations.***

Our business is influenced by market and economic conditions, including inflation, deflation, interest rates, availability and cost of capital, consumer spending rates, energy availability and the effects of governmental initiatives to manage economic conditions. Volatility in financial markets and the continued softness or further deterioration of national and global economic conditions could have a material adverse effect on our financial condition, liquidity or results of operations, including as follows:

- the financial stability of our customers or suppliers may be compromised, which could result in additional bad debts for us or non-performance by suppliers;
- commercial and residential consumers of our products may postpone spending in response to tighter credit, negative financial news and/or stagnation or further declines in income or asset values, which could have a material adverse impact on the demand for our products;
- the value of investments underlying our defined benefit pension plans may decline, which could result in negative plan investment performance and additional charges which may involve significant cash contributions to such plans, to meet obligations or regulatory requirements; and
- our asset impairment assessments and underlying valuation assumptions may change, which could result from changes to estimates of future sales and cash flows that may lead to substantial impairment charges.

Continued or sustained deterioration of economic conditions would likely exacerbate and prolong these adverse effects.

### ***Our business is dependent on construction activity. Downturns in construction activity could have a material adverse effect on our financial condition, liquidity or results of operations.***

Our businesses have greater sales opportunities when construction activity is strong and, conversely, have fewer opportunities when such activity declines. The cyclical nature of commercial and residential construction activity, including construction activity funded by the public sector, tends to be influenced by prevailing economic conditions, including the rate of growth in gross domestic product, prevailing interest rates, government spending patterns, business, investor and consumer confidence and other factors beyond our control. Prolonged downturns in construction activity could have a material adverse effect on our financial condition, liquidity or results of operations.

### ***Our markets are highly competitive. Competition could reduce demand for our products or negatively affect our sales mix or price realization. Failure to compete effectively by meeting consumer preferences, developing and marketing innovative solutions, maintaining strong customer service and distribution relationships, and expanding our solutions capabilities and reach could adversely affect our results.***

Our customers consider our products' performance, product styling, customer service and price when deciding whether to purchase our products. Shifting consumer preference in our highly competitive markets, from acoustical solutions to other ceiling and wall products, for example, whether for performance or styling preferences or our inability to develop and offer new competitive performance features could have an adverse effect on our sales. Similarly, our ability to identify, protect and market new and innovative solutions is critical to our long-term growth strategy, namely to sell into more spaces and sell more solutions in every space. If our competitors offer discounts on certain products or provide new or alternative offerings that the marketplace perceives as more cost-effective, it could adversely affect our price realization. Any broad-based change to our price realization could cause our revenues and margins to decline.

***Sales fluctuations to and changes in our relationships with key customers could have a material adverse effect on our financial condition, liquidity or results of operations.***

The loss, reduction, or fluctuation of sales to key customers, including independent distributors, or any adverse change in our business relationship with them, whether as a result of competition, industry consolidation or otherwise, could have a material adverse effect on our financial condition, liquidity or results of operations.

***Customer consolidation, and competitive, economic and other pressures facing our customers, may negatively impact our operating margins and profitability.***

A number of our customers, including distributors and contractors, have consolidated in recent years and consolidation could continue. Further consolidation could impact margin growth and profitability as larger customers may realize certain operational and other benefits of scale. The economic and competitive landscape for our customers is constantly changing, and our customers' responses to those changes could impact our business. These factors and others could have a material adverse impact on our business, financial condition or results of operations.

***If the availability of raw materials or energy decreases, or the costs increase, and we are unable to pass along increased costs, our financial condition, liquidity or results of operations could be adversely affected.***

The availability and cost of raw materials, packaging materials, energy and sourced products are critical to our operations and our results of operations. For example, we use substantial quantities of natural gas and petroleum-based raw materials in our manufacturing operations. The cost of some of these items has been volatile in recent years and availability has been limited at times. We source some materials from a limited number of suppliers, which, among other things, increases the risk of unavailability. Limited availability could cause us to reformulate products or limit our production. Decreased access to raw materials and energy or significant increased cost to purchase these items and any corresponding inability to pass along such costs through price increases could have a material adverse effect on our financial condition, liquidity or results of operations.

***The performance of our WAVE joint venture is important to our financial results. Changes in the demand for, or quality of, WAVE products, or in the operational or financial performance of the WAVE joint venture, could have a material adverse effect on our financial condition, liquidity or results of operations. Similarly, if there is a change with respect to our joint venture partner that adversely impacts its relationship with us, WAVE's performance could be adversely impacted.***

Our equity investment in our WAVE joint venture remains important to our financial results. WAVE's markets are highly competitive, and changes in the demand for, or quality of, WAVE products, or in the operational or financial performance of the WAVE joint venture, could have a material adverse effect on its financial condition, liquidity or results of operations. Similarly, the availability and cost of raw materials, packaging materials, energy and sourced products are critical to WAVE's operations and its results of operations.

We believe another important element in the success of this joint venture is the relationship with our partner, Worthington Industries, Inc. If there is a change in ownership, a change of control, a change in management or management philosophy, a change in business strategy or another event with respect to our partner that adversely impacts our relationship, WAVE's performance could be adversely impacted. In addition, our partner may have economic or business interests or goals that are different from or inconsistent with our interests or goals, which may impact our ability to influence or align WAVE's strategy and operations.

***The geographic concentration of our business could subject us to greater risk than our competitors and could have a material adverse effect on our financial condition, liquidity or results of operations.***

As a result of the recent divestiture of our Europe, Middle East and Africa (including Russia) and Pacific Rim businesses to Knauf International GmbH, we primarily operate in the United States, Canada and Latin America. Our concentrated operations in the Americas could subject us to a greater degree of risk relative to our global, diversified competitors. We are particularly vulnerable to adverse events (including acts of terrorism, natural disasters, weather conditions, labor market disruptions and government actions) and economic conditions in the United States, Canada and Latin America. Adverse events or conditions in these geographic areas could have a material adverse effect on our financial condition, liquidity or results of operations.

***We may pursue strategic transactions, including mergers, acquisitions, joint ventures, strategic alliances or other investments, which could create risks and present unforeseen integration obstacles or costs, any of which could have a material adverse effect on our financial condition, liquidity or results of operations.***

We regularly evaluate potential mergers, acquisitions, joint ventures, strategic alliances or other investments that we believe could complement, enhance or expand our current businesses or product lines or that might otherwise offer us growth opportunities. Any such strategic transaction involves a number of risks, including potential disruption of our ongoing business and distraction of management, difficulty with integrating or separating personnel and business operations and infrastructure, and increasing or decreasing the scope, geographic diversity and complexity of our operations. Strategic transactions could involve payment by us of a substantial amount of cash, assumption of liabilities and indemnification obligations, regulatory requirements, incurrence of a substantial amount of debt or issuance of a substantial amount of equity. Certain strategic opportunities may not result in the consummation of a transaction or may fail to realize the intended benefits and synergies. If we fail to consummate and integrate our strategic transactions in a timely and cost-effective manner, our financial condition, liquidity or results of operation could be materially and adversely affected.

***Negative tax consequences can have an unanticipated effect on our financial results.***

We are subject to the tax laws of the many jurisdictions in which we operate. The tax laws are complex, and the manner in which they apply to our operations and results is sometimes open to interpretation. Our income tax expense and reported net income may fluctuate significantly, and may be materially different than forecasted or experienced in the past. Our financial condition, liquidity, results of operations or tax liability could be adversely affected by changes in effective tax rates, changes in our overall profitability, changes in tax legislation, the results of examinations of previously filed tax returns, and ongoing assessments of our tax exposures.

Our financial condition, liquidity, results of operations or tax liability could also be adversely affected by changes in the valuation of deferred tax assets and liabilities. We have substantial deferred tax assets related to U.S. domestic foreign tax credits (“FTCs”), a capital loss carryforward, and state net operating losses (“NOLs”), which are available to reduce our U.S. income tax liability and to offset future state taxable income. However, our ability to utilize the current carrying value of these deferred tax assets may be impacted as a result of certain future events, such as changes in tax legislation and insufficient future taxable income prior to expiration of the FTCs, capital loss carryforwards, and NOLs.

***We may be subject to liability under, and may make substantial future expenditures to comply with, environmental laws and regulations, which could have a material adverse effect on our financial condition, liquidity or results of operations.***

We are actively involved in environmental investigation and remediation activities relating to several domestically owned, formerly owned and non-owned locations allegedly resulting from past industrial activity, for which our ultimate liability may exceed the currently estimated and accrued amounts. See Note 27 to the Consolidated Financial Statements for further information related to our current environmental matters and the potential liabilities associated therewith. It is also possible that we could become subject to additional environmental matters and corresponding liabilities in the future.

The building materials industry has been subject to claims relating to raw materials such as silicates, polychlorinated biphenyl (“PCB”), PVC, formaldehyde, fire-retardants and claims relating to other issues such as mold and toxic fumes, as well as claims for incidents of catastrophic loss, such as building fires. We have not received any significant claims involving our raw materials or our product performance; however, product liability insurance coverage may not be available or adequate in all circumstances to cover claims that may arise in the future.

In addition, our operations are subject to various environmental, health, and safety laws and regulations. These laws and regulations not only govern our current operations and products, but also impose potential liability on us for our past operations. Our costs to comply with these laws and regulations may increase as these requirements become more stringent in the future, and these increased costs may have a material adverse effect on our financial condition, liquidity or results of operations.

***Our operating and information systems may experience a failure, a compromise of security, or a violation of data privacy laws or regulations, which could interrupt or damage our operations.***

In the conduct of our business, we collect, use, transmit and store data on information systems, which are vulnerable to disruption and an increasing threat of continually evolving cybersecurity risks. These information systems may be disrupted or fail as a result of events that are wholly or partially beyond our control, including events such as natural disasters, power loss, software “bugs”, hardware defects, hacking, computer viruses, malware, ransomware or other cyber-attacks. All of these risks are also applicable where we rely on outside vendors to provide services, which may operate in a cloud environment. We are dependent on third-party vendors

to operate secure and reliable systems which may include data transfers over the internet. Any events which deny us use of vital operating or information systems may seriously disrupt our normal business operations.

We also compete through our use of information technology. We strive to provide customers with timely, accurate, easy-to-access information about product availability, orders and delivery status using state-of-the-art systems. While we have processes for short-term failures and disaster recovery capability, a prolonged disruption of systems or other failure to meet customers' expectations regarding the capabilities and reliability of our systems may have a material adverse effect on our operating results.

We could also experience a compromise of our information security due to technical system flaws, clerical, data input or record-keeping errors, or tampering or manipulation of our systems by employees or unauthorized third parties. Information security risks also exist with respect to the use of portable electronic devices, such as laptops and smartphones, which are particularly vulnerable to loss and theft. Any security breach or compromise of our information systems could significantly damage our reputation, cause the disclosure of confidential customer, employee, supplier or company information, including our intellectual property, and result in significant losses, litigation, fines and costs. The security measures we have implemented to protect against unauthorized access to our information systems and data may not be sufficient to prevent breaches. The regulatory environment related to information security, data collection and privacy is evolving, with new and constantly changing requirements applicable to our business, and compliance with those requirements could result in additional costs.

Additionally, our key partners, distributors or suppliers could experience a compromise of their information security due to technical system flaws, clerical, data input or record-keeping errors, or tampering or manipulation of their respective systems by employees or third parties, which may have an impact on our commercial sales, vendor, partner or other relationships.

***Adverse results caused by regulatory actions, product claims, environmental claims and other litigation could be costly. Insurance coverage may not be available or adequate in all circumstances.***

In the ordinary course of business, we are subject to various claims and litigation. Any such claims, whether with or without merit, could be time consuming and expensive to defend and could divert management's attention and resources. While we strive to ensure that our products comply with applicable government regulatory standards and internal requirements, and that our products perform effectively and safely, customers from time to time could claim that our products do not meet warranty or contractual requirements, and users could claim to be harmed by use or misuse of our products. These claims could give rise to breach of contract, warranty or recall claims, or claims for negligence, product liability, strict liability, personal injury or property damage. They could also result in negative publicity.

In addition, claims and investigations may arise related to patent infringement, distributor relationships, commercial contracts, antitrust or competition law requirements, employment matters, employee benefits issues, and other compliance and regulatory matters, including anti-corruption and anti-bribery matters. While we have processes and policies designed to mitigate these risks and to investigate and address such claims as they arise, we cannot predict or, in some cases, control the costs to defend or resolve such claims.

We currently maintain insurance against some, but not all, of these potential claims. In the future, we may not be able to maintain insurance at commercially acceptable premium levels. In addition, the levels of insurance we maintain may not be adequate to fully cover any and all losses or liabilities. If any significant judgment or claim is not fully insured or indemnified against, it could have a material adverse impact. We cannot assure that the outcome of all current or future litigation will not have a material adverse effect on our financial condition, liquidity or results of operations.

***We may not experience the anticipated benefits from our strategic initiatives, including investments in digitalization and new technology.***

We continue to evaluate and may pursue strategic initiatives involving the development or utilization of new or innovative products, solutions and tools, as well as the expansion of our capabilities through digitalization. These initiatives are designed to grow revenue, improve profitability and increase shareholder value. Our results of operations and financial position could be materially and adversely affected if we are unable to successfully identify, execute and integrate these initiatives or if we are unable to complete these initiatives in a timely and efficient manner to realize competitive advantages and opportunities.

***The agreements that govern our indebtedness contain a number of covenants that impose significant operating and financial restrictions, including restrictions on our ability to engage in activities that may be in our best long-term interests.***

The agreements that govern our indebtedness include covenants that, among other things, may impose significant operating and financial restrictions, including restrictions on our ability to engage in activities that may be in our best long-term interests. These covenants may restrict our ability to:

- incur additional debt;
- pay dividends on or make other distributions in respect of our capital stock or redeem, repurchase or retire our capital stock or subordinated debt or make certain other restricted payments;
- make certain acquisitions;
- sell certain assets;
- consolidate, merge, sell or otherwise dispose of all or substantially all of our assets; and
- create liens on certain assets to secure debt.

Under the terms of our senior secured credit facility, we are required to maintain specified leverage and interest coverage ratios. Our ability to meet these ratios could be affected by events beyond our control, and we cannot assure that we will meet them. A breach of any of the restrictive covenants or ratios would result in a default under the senior secured credit facility. If any such default occurs, the lenders under the senior secured credit facility may be able to elect to declare all outstanding borrowings under our facilities, together with accrued interest and other fees, to be immediately due and payable, or enforce their security interest. The lenders may also have the right in these circumstances to terminate commitments to provide further borrowings.

***Our indebtedness may adversely affect our cash flow and our ability to operate our business, make payments on our indebtedness and declare dividends on our capital stock.***

Our level of indebtedness and degree of leverage could:

- make it more difficult for us to satisfy our obligations with respect to our indebtedness;
- make us more vulnerable to adverse changes in general economic, industry and competitive conditions and adverse changes in government regulation;
- limit our flexibility in planning for, or reacting to, changes in our business and the industry in which we operate;
- place us at a competitive disadvantage compared to our competitors that are less leveraged and, therefore, more able to take advantage of opportunities that our leverage prevents us from exploiting;
- limit our ability to refinance existing indebtedness or borrow additional amounts for working capital, capital expenditures, acquisitions, debt service requirements, execution of our business strategy or other purposes;
- restrict our ability to pay dividends on our capital stock; and
- adversely affect our credit ratings.

We may also incur additional indebtedness, which could exacerbate the risks described above. In addition, to the extent that our indebtedness bears interest at floating rates, our sensitivity to interest rate fluctuations will increase.

Any of the above listed factors could have a material adverse effect on our financial condition, liquidity or results of operations.

***We require a significant amount of liquidity to fund our operations, and borrowing has increased our exposure to negative unforeseen events.***

Our liquidity needs vary throughout the year. If our business experiences materially negative unforeseen events, we may be unable to generate sufficient cash flow from operations to fund our needs or maintain sufficient liquidity to operate and remain in compliance with our debt covenants, which could result in reduced or delayed planned capital expenditures and other investments and have a material adverse effect on our financial condition or results of operations.

***Significant changes in factors and assumptions used to measure our defined benefit plan obligations, actual investment returns on pension assets and other factors could negatively impact our operating results and cash flows.***

We maintain significant pension and postretirement plans in the U.S. The recognition of costs and liabilities associated with these plans for financial reporting purposes is affected by assumptions made by management and used by actuaries engaged by us to calculate the benefit obligations and the expenses recognized for these plans.

The inputs used in developing the required estimates are calculated using a number of assumptions, which represent management's best estimate of the future. The assumptions that have the most significant impact on reported results are the discount rate, the estimated long-term return on plan assets for the funded plans, retirement rates, and mortality rates and, for postretirement plans, the estimated inflation in health care costs. These assumptions are generally updated annually.

Our U.S. pension plans were overfunded by \$47.0 million as of December 31, 2019. Our unfunded U.S. postretirement plan liabilities were \$77.5 million as of December 31, 2019. If our cash flows and capital resources are insufficient to fund our pension and postretirement plans obligations, we could be forced to reduce or delay investments and capital expenditures, seek additional capital, or restructure or refinance our indebtedness.

***Our intellectual property rights may not provide meaningful commercial protection for our products or brands, which could adversely impact our financial condition, liquidity or results of operations.***

We rely on our proprietary intellectual property, including numerous patents and registered trademarks, as well as our licensed intellectual property to market, promote and sell our products. We monitor and protect against activities that might infringe, dilute, or otherwise harm our patents, trademarks and other intellectual property and rely on the patent, trademark and other laws of the U.S. and other countries. However, we may be unable to prevent third parties from using our intellectual property without our authorization. In addition, the laws of some non-U.S. jurisdictions, particularly those of certain emerging markets, provide less protection for our proprietary rights than the laws of the U.S. and present greater risks of counterfeiting and other infringement. To the extent we cannot protect our intellectual property, unauthorized use and misuse of our intellectual property could harm our competitive position and have a material adverse effect on our financial condition, liquidity or results of operations.

***Increased focus by governmental and non-governmental organizations, customers, consumers and investors on sustainability issues, including those related to climate change, may have a material adverse effect on our business, financial condition and results of operations and damage our reputation.***

Increased focus by governmental and non-governmental organizations, customers, consumers and investors on sustainability issues, including those related to climate change, may have a material adverse effect on our business, financial condition and results of operations and damage our reputation. As climate change, land use, water use, deforestation, recyclability or recoverability of products, and other sustainability concerns become more prevalent, governmental and non-governmental organizations, customers, consumers and investors are increasingly focusing on these issues. This increased focus on environmental issues and sustainability may result in new or increased regulations and customer and investor demands that could cause us to incur additional costs or to make changes to our operations to comply with any such regulations and demands.

***If the separation and distribution of Armstrong Flooring, Inc. ("AFI") fails to qualify as a tax-free transaction for U.S. federal income tax purposes, then AFI, AWI and AWI's shareholders could be subject to significant tax liability or tax indemnity obligations.***

On April 1, 2016, we completed our previously announced separation of AFI by allocating the assets and liabilities related primarily to the Resilient Flooring and Wood Flooring segments to AFI and then distributing the common stock of AFI to our shareholders at a ratio of one share of AFI common stock for every two shares of AWI common stock. In connection with the distribution, we received an opinion from our special tax counsel, on the basis of certain facts, representations, covenants and assumptions set forth in such opinion, substantially to the effect that, for U.S. federal income tax purposes, the separation and distribution should qualify as a transaction that generally is tax-free to us and our shareholders under Sections 355 and 368(a)(1)(D) of the Internal Revenue Code.

Notwithstanding the tax opinion, the Internal Revenue Service ("IRS") could determine on audit that the distribution should be treated as a taxable transaction if it determines that any of the facts, assumptions, representations or covenants set forth in the tax opinion is not correct or has been violated, or that the distribution should be taxable for other reasons, including as a result of a significant change in stock or asset ownership after the distribution, or if the IRS were to disagree with the conclusions of the tax opinion. If the distribution is ultimately determined to be taxable, the distribution could be treated as a taxable dividend to each U.S. holder of our common shares who receives shares of AFI in connection with the spinoff for U.S. federal income tax purposes, and such shareholders could incur significant U.S. federal income tax liabilities. In addition, we and/or AFI could incur significant U.S. federal income tax



liabilities or tax indemnification obligations, whether under applicable law or the Tax Matters Agreement that we entered into with AFI, if it is ultimately determined that certain related transactions undertaken in anticipation of the distribution are taxable.

***We are subject to risks associated with our international operations in Canada and Latin America. Legislative, political, regulatory and economic volatility, as well as vulnerability to infrastructure and labor disruptions, could have a material adverse effect on our financial condition, liquidity or results of operations.***

A portion of our products move in international trade. See Note 3 to the Consolidated Financial Statements for further information. Our international trade is subject to currency exchange fluctuations, trade regulations, import duties, logistics costs, delays and other related risks. Our international operations are also subject to various tax rates, credit risks in emerging markets, political risks, uncertain legal systems, and loss of sales to local competitors following currency devaluations in countries where we import products for sale. In addition, our international growth strategy depends, in part, on our ability to expand our operations in Canada and Latin America. However, some emerging markets have greater political and economic volatility and greater vulnerability to infrastructure and labor disruptions than established markets. Similarly, our efforts to enhance the profitability or accelerate the growth of our operations in certain markets depends largely on the economic and geopolitical conditions in those local or regional markets.

In addition, in many countries outside of the United States, particularly in those with developing economies, it may be common for others to engage in business practices prohibited by laws and regulations applicable to us, such as the Foreign Corrupt Practices Act or similar local anti-corruption or anti-bribery laws. These laws generally prohibit companies and their employees, contractors or agents from making improper payments to government officials for the purpose of obtaining or retaining business. Failure to comply with these laws, as well as U.S. and foreign export and trading laws, could subject us to civil and criminal penalties. As we continue to expand our business, we may have difficulty anticipating and effectively managing these and other risks that our operations may face, which may adversely affect our business outside the United States and our financial condition, liquidity or results of operations.

***From time to time, we engage in cost-saving and productivity initiatives. Any such initiatives may not achieve expected savings in our operating costs or improved operating results.***

We aggressively look for ways to make our operations more efficient and effective. We may reduce, move, modify and expand our plants and operations, as well as our sourcing and supply chain arrangements, as needed, to control costs and improve productivity. Such actions involve substantial planning, often require capital investments and may result in charges for fixed asset impairments or obsolescence and substantial severance costs. Our ability to achieve cost savings and other benefits within expected time frames is subject to many estimates and assumptions. These estimates and assumptions are subject to significant economic, competitive and other uncertainties, some of which are beyond our control. If these estimates and assumptions are incorrect, if we experience delays, or if other unforeseen events occur, our financial condition, liquidity or results of operations could be materially and adversely affected.

***Increased costs of labor, labor disputes, work stoppages or union organizing activity could delay or impede production and could have a material adverse effect on our financial condition, liquidity or results of operations.***

Increased costs of labor, including the costs of employee benefits plans, labor disputes, work stoppages or union organizing activity could delay or impede production and have a material adverse effect on our financial condition, liquidity or results of operations. As the majority of our manufacturing employees are represented by unions and covered by collective bargaining or similar agreements, we often incur costs attributable to periodic renegotiation of those agreements, which may be difficult to project. We are also subject to the risk that strikes or other conflicts with organized personnel may arise or that we may become the subject of union organizing activity at our facilities that do not currently have union representation. Prolonged negotiations, conflicts or related activities could also lead to costly work stoppages and loss of productivity.

***We cannot provide any guarantee of future cash dividend payments or that we will be able to repurchase our common stock pursuant to a share repurchase program.***

Since December 2018, our Board of Directors has declared a quarterly dividend on our common stock. The payment of any future cash dividends to our shareholders is not guaranteed and will depend on decisions that will be made by our Board of Directors and will be based upon our financial condition, results of operations, business requirements and our Board of Directors' conclusion that the declaration of cash dividends is in the best interest of our shareholders and is in compliance with all laws and agreements applicable to the payment of dividends.

Since July 2016, our Board of Directors has approved share repurchases up to a total of \$700.0 million. Repurchases under the program may be made through open market, block and privately-negotiated transactions, including Rule 10b5-1 plans, at times and in

amounts as management deems appropriate, subject to market and business conditions, regulatory requirements and other factors. The program does not obligate the company to repurchase any particular amount of common stock and may be suspended or discontinued at any time without notice. Furthermore, there can be no assurance that we will be able to repurchase our common stock and we may discontinue plans to repurchase common stock at any time.

**ITEM 1B. UNRESOLVED STAFF COMMENTS**

None.

**ITEM 2. PROPERTIES**

We own a 100-acre, multi-building campus in Lancaster, Pennsylvania comprising the site of our corporate headquarters and most of our non-manufacturing operations.

As of December 31, 2019, we had 14 manufacturing plants in three countries, with 11 plants located throughout the U.S., which included our St. Helens, Oregon mineral fiber manufacturing facility, which closed in the second quarter of 2018. During 2019, as part of our acquisitions of ACGI and MRK, we acquired two additional plants located in Missouri and Illinois, respectively. We have two plants in Canada and one idle mineral fiber plant in China. The idle plant in China is reported as a component of our Unallocated Corporate segment and is classified as an asset held for sale as of December 31, 2019, as we entered into a sale agreement for the property during the third quarter of 2019 with closing expected in the second quarter of 2020.

WAVE operates five additional plants in the U.S. to produce suspension system (grid) products, which we use and sell in our ceiling systems.

Five of our plants are leased and the remaining nine are owned.

<u>Operating Segment</u>	<u>Number of Plants</u>	<u>Location of Principal Facilities</u>
Mineral Fiber	6	U.S. (Florida, Georgia, Ohio, Oregon, Pennsylvania and West Virginia)
Architectural Specialties	7	U.S. (Illinois, Ohio and Missouri), Canada (Quebec and Ontario)
Unallocated Corporate	1	China

Sales and administrative offices are leased and/or owned worldwide, and leased facilities are utilized to supplement our owned warehousing facilities.

Production capacity and the extent of utilization of our facilities are difficult to quantify with certainty. In any one facility, utilization of our capacity varies periodically depending upon demand for the product that is being manufactured. We believe our facilities are adequate and suitable to support the business. Additional incremental investments in plant facilities are made as appropriate to balance capacity with anticipated demand, improve quality and service, and reduce costs.

**ITEM 3. LEGAL PROCEEDINGS**

See the “Specific Material Events” section of the “Environmental Matters” section of Note 27 to the Consolidated Financial Statements, which is incorporated herein by reference, for a description of our significant legal proceedings.

**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**

AWI's common shares trade on the New York Stock Exchange under the ticker symbol "AWI." As of February 18, 2020, there were approximately 230 holders of record of AWI's common stock.

Dividends are payable when declared by our Board of Directors and in accordance with restrictions set forth in our debt agreements. In general, our debt agreements allow us to make "restricted payments," which include dividends and stock repurchases, subject to certain limitations and other restrictions and provided that we are in compliance with the financial and other covenants of our debt agreements and meet certain liquidity requirements after giving effect to the restricted payment. We declared dividends, on a quarterly basis, totaling \$0.725 per share in 2019. On February 19, 2020, our Board of Directors declared a dividend of \$0.20 per common share outstanding. The dividend will be paid on March 20, 2020, to shareholders of record as of the close of business on March 5, 2020. For further discussion of the debt agreements, see the Financial Condition and Liquidity section of Management's Discussion and Analysis of Financial Condition and Results of Operations in Item 7 and Risk Factors in Item 1A in this Form 10-K.

#### Issuer Purchases of Equity Securities

<u>Period</u>	<u>Total Number of Shares Purchased <sup>(1)</sup></u>	<u>Average Price Paid per Share</u>	<u>Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs</u>	<u>Maximum Approximate Value of Shares that may yet be Purchased under the Plans or Programs</u>
October 1 – 31, 2019	35,684	\$ 94.65	34,179	\$ 185,003,673
November 1 – 30, 2019	299,194	\$ 94.12	298,872	\$ 156,874,100
December 1 – 31, 2019	197,864	\$ 94.69	197,516	\$ 138,171,417
Total	<u>532,742</u>		<u>530,567</u>	

- (1) Includes shares reacquired through the withholding of shares to pay employee tax obligations upon the exercise of options or vesting of restricted shares previously granted under our long term incentive plans. For more information regarding securities authorized for issuance under our equity compensation plans, see Note 22 to the Consolidated Financial Statements included in this Form 10-K.

On July 29, 2016, we announced that our Board of Directors had approved a share repurchase program pursuant to which we were authorized to repurchase up to \$150.0 million of our outstanding shares of common stock through July 31, 2018 (the "Program"). On October 30, 2017, we announced that our Board of Directors had approved an additional \$250.0 million authorization to repurchase shares under the Program. The Program was also extended through October 31, 2020. On July 31, 2018, we announced that our Board of Directors had approved an additional \$300.0 million authorization to repurchase shares, increasing the total authorized amount under the Program to \$700.0 million, excluding commissions.

Repurchases under the Program may be made through open market, block and privately-negotiated transactions, including Rule 10b5-1 plans, at such times and in such amounts as management deems appropriate, subject to market and business conditions, regulatory requirements and other factors. The Program does not obligate AWI to repurchase any particular amount of common stock and may be suspended or discontinued at any time without notice.

On August 2, 2018, we entered into an accelerated share repurchase ("ASR") agreement with Deutsche Bank AG under the Program. The ASR included a pre-payment of \$150.0 million to Deutsche Bank AG, at which time we received 1,766,004 shares. The ASR terminated on October 8, 2018, with an additional 389,825 shares returned on that day to complete the ASR.

During 2019, we repurchased 1.5 million shares under the Program for a cost of \$131.2 million, excluding commissions, or an average price of \$86.02 per share. Since inception, including the ASR, we have repurchased 9.2 million shares under the Program for a cost of \$561.8 million, excluding commissions, or an average price of \$60.98 per share.

**ITEM 6. SELECTED FINANCIAL DATA**

The following selected historical consolidated financial data should be read in conjunction with our audited consolidated financial statements, the accompanying notes and Management's Discussion and Analysis of Financial Condition and Results of Operations included in this Form 10-K. The selected historical consolidated financial data for the periods presented have been derived from our audited consolidated financial statements.

	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
(amounts in millions, except for per-share data)					
<b><u>Income statement data</u></b>					
Net sales	\$ 1,038.1	\$ 975.3	\$ 893.6	\$ 837.3	\$ 805.1
Operating income	317.4	249.4	243.8	195.9	166.6
Earnings from continuing operations	242.3	189.6	220.6	99.3	57.9
Per common share - basic (a)	\$ 4.97	\$ 3.68	\$ 4.12	\$ 1.79	\$ 1.04
Per common share - diluted (a)	\$ 4.88	\$ 3.63	\$ 4.08	\$ 1.78	\$ 1.03
Cash dividends per share of common stock	\$ 0.725	\$ 0.175	\$ -	\$ -	\$ -
<b><u>Balance sheet data (end of period)</u></b>					
Total assets (b)	\$ 1,493.3	\$ 1,838.3	\$ 1,838.3	\$ 1,758.0	\$ 2,687.2
Long-term debt	604.5	764.8	817.7	848.6	936.1
Total shareholders' equity (b)	364.9	226.0	384.1	266.4	768.8

**Notes:**

- (a) See definition of basic and diluted earnings per share in Note 2 to the Consolidated Financial Statements.
- (b) During 2019, we revised the Consolidated Financial Statements and related notes included herein to correct an immaterial error related to the previously reported estimated loss on sale of our EMEA and Pacific Rim businesses. The immaterial correction increased the estimated loss on sale and reduced the assets held for sale by \$35.2 million as of December 31, 2017. See Note 2 to the Consolidated Financial Statements for further discussion.

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

Armstrong World Industries, Inc. ("AWI") is a Pennsylvania corporation incorporated in 1891.

This discussion should be read in conjunction with the financial statements, the accompanying notes, the cautionary note regarding forward-looking statements and risk factors included in this Form 10-K.

### **Overview**

We are a leading producer of ceiling systems for use in the construction and renovation of commercial and residential buildings. We design, manufacture and sell ceiling and wall systems (primarily mineral fiber, fiberglass wool, metal, wood, wood fiber, glass-reinforced-gypsum and felt) throughout the Americas.

### **Acquisitions**

In November 2019, we acquired the business and assets of MRK Industries, Inc. ("MRK"), based in Libertyville, Illinois. MRK is a manufacturer of specialty metal ceiling, wall and exterior solutions with one manufacturing facility. MRK's operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In March 2019, we acquired the business and assets of Architectural Components Group, Inc. ("ACGI"), based in Marshfield, Missouri. ACGI is a manufacturer of custom wood ceilings and walls with one manufacturing facility. ACGI's operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In August 2018, we acquired the business and assets of Steel Ceilings, Inc. ("Steel Ceilings"), based in Johnstown, Ohio. Steel Ceilings is a manufacturer of aluminum and stainless metal ceilings that include architectural, radiant and security solutions with one manufacturing facility. Steel Ceilings' operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In May 2018, we acquired the business and assets of Plasterform, Inc. ("Plasterform"), based in Mississauga, Ontario, Canada. Plasterform is a manufacturer of architectural cast ceilings, walls, facades, columns and moldings with one manufacturing facility. Plasterform's operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In January 2017, we acquired the business and assets of Tectum, Inc. ("Tectum"), based in Newark, Ohio. Tectum is a manufacturer of acoustical ceiling, wall and structural solutions for commercial building applications with two manufacturing facilities. Tectum's operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

### **Discontinued Operations**

On September 30, 2019, we completed the previously announced sale of certain subsidiaries comprising our businesses and operations in Europe, the Middle East and Africa (including Russia) ("EMEA") and the Pacific Rim, including the corresponding businesses and operations conducted by Worthington Armstrong Venture ("WAVE"), our joint venture with Worthington Industries, Inc. ("Worthington") in which AWI holds a 50% interest (collectively, the "Sale"), to Knauf International GmbH ("Knauf"). The purchase price of \$330.0 million was previously paid by Knauf to us during the third quarter of 2018 and is subject to certain post-closing adjustments for cash and debt as provided in the Share Purchase Agreement dated as of November 17, 2017, by and between us and Knauf (the "Purchase Agreement"), including adjustments based on the economic impact of any required regulatory remedies and a working capital adjustment.

On July 18, 2018, we entered into an amendment to the Purchase Agreement, pursuant to which Knauf irrevocably and unconditionally paid AWI (i) \$250.0 million of the purchase price on August 1, 2018, and (ii) \$80.0 million of the purchase price on September 15, 2018, which payments were credited against the aggregate consideration payable at closing. The amendment also provided for the reduction (from a maximum of \$35.0 million to a maximum of \$20.0 million) of potential adjustments to the purchase price consideration for the transaction based on the impact of remedies required to satisfy competition conditions. Following receipt of these payments, we remitted \$70.0 million to WAVE in partial consideration of the purchase price payable in respect of the businesses and operations of WAVE under the transaction. WAVE subsequently paid each of AWI and Worthington a dividend of \$35.0 million. We have recorded a \$25.9 million payable to WAVE for their remaining portion of the proceeds from Knauf, which is reflected within Accounts payable and accrued expenses in the Consolidated Balance Sheets as of December 31, 2019. The transaction and final gain or loss amounts are subject to finalization of customary working capital and other adjustments, as provided in the Purchase Agreement. For the year ended December 31, 2019, payments to Knauf included \$61.0 million of adjustments to cash consideration, estimated working capital adjustments and remedies, offset by \$13.1 million of additional cash in international WAVE entities.

## Management's Discussion and Analysis of Financial Condition and Results of Operations

On December 7, 2018, the European Commission granted conditional clearance of the transaction, subject to certain commitments intended to address concerns regarding the overlap between the activities of AWI and Knauf, including the divestment by Knauf to a third party of certain mineral fiber and grid businesses and operations in Austria, Estonia, Germany, Ireland, Italy, Latvia, Lithuania, Portugal, Spain, Turkey and the United Kingdom ("UK"). This included our sales operations in each of the relevant countries, as well as our production facilities, and those of WAVE, located in Team Valley, UK.

On May 23, 2019, we entered into a Transition Services Agreement with Knauf for its benefit and the benefit of the buyer of the divestment business, pursuant to which we are providing certain transition technology, finance and information technology support services during the period between March 18, 2019 and September 30, 2020.

On September 23, 2019, the European Commission approved the Sale, as well as the terms of the sale of the divestment business by Knauf and the identity of the purchaser.

In connection with the closing of the Sale, we also entered into (i) an intellectual property License Agreement with Knauf for its benefit (and, under sublicense, to the buyer of the divestment business) under which they license certain patents, trademarks and know-how from us for use in certain licensed territories, and (ii) a Supply Agreement with Knauf under which the parties may continue to purchase certain products from each other following the closing of the Sale. WAVE also entered into similar agreements with Knauf for such purposes.

The EMEA and Pacific Rim segment historical financial results through September 30, 2019 have been reflected in AWI's Consolidated Statements of Earnings and Comprehensive Income as discontinued operations for all periods presented, while the assets and liabilities of discontinued operations have been removed from AWI's Consolidated Balance Sheet as of December 31, 2019.

See Notes 5 and 6 to the Consolidated Financial Statements for additional information related to our acquisitions and discontinued operations.

### Manufacturing Plants

As of December 31, 2019, we had 14 manufacturing plants in three countries, with 11 plants located within the U.S, which included our St. Helens, Oregon mineral fiber manufacturing facility, which closed in the second quarter of 2018. During 2019, as part of our acquisitions of ACGI and MRK, we acquired two additional plants located in Missouri and Illinois, respectively. We have two plants in Canada and one idle mineral fiber plant in China. The idle plant in China is reported as a component of our Unallocated Corporate segment and is classified as an asset held for sale as of December 31, 2019, as we entered into a sale agreement for the property during the third quarter of 2019 with closing expected in the second quarter of 2020.

WAVE operates five additional plants in the U.S. to produce suspension system (grid) products, which we use and sell in our ceiling systems.

### Reportable Segments

Our operating segments are as follows: Mineral Fiber, Architectural Specialties and Unallocated Corporate.

*Mineral Fiber* – produces suspended mineral fiber and soft fiber ceiling systems for use in commercial and residential settings. Products offer various performance attributes such as acoustical control, rated fire protection and aesthetic appeal. Commercial ceiling products are sold to resale distributors and to ceiling systems contractors. Residential ceiling products are sold primarily to wholesalers and retailers (including large home centers). The Mineral Fiber segment also includes the results of WAVE, which manufactures and sells suspension system (grid) products and ceiling component products that are invoiced by both AWI and WAVE. Segment results relating to WAVE consist primarily of equity earnings and reflect our 50% equity interest in the joint venture. Ceiling component products consist of ceiling perimeters and trim, in addition to grid products that support drywall ceiling systems. To a lesser extent, however, in some geographies and for some customers, WAVE sells its suspension systems products to AWI for resale to customers. Mineral Fiber segment results reflect those sales transactions. The Mineral Fiber segment also includes all assets and liabilities not specifically allocated to our Architectural Specialties or Unallocated Corporate segment, including all property and related depreciation associated with our Lancaster, PA headquarters. Operating results for the Mineral Fiber segment include a significant majority of allocated Corporate administrative expenses that represent a reasonable allocation of general services to support its operations.

*Architectural Specialties* – produces and sources ceilings and walls for use in commercial settings. Products are available in numerous materials, such as metal and wood, in addition to various colors, shapes and designs. Products offer various performance attributes

## Management’s Discussion and Analysis of Financial Condition and Results of Operations

such as acoustical control, rated fire protection and aesthetic appeal. We sell standard and customized products, with the majority of Architectural Specialties revenues derived from sourced products. Architectural Specialties products are sold primarily to resale distributors and ceiling systems contractors. The majority of revenues are project driven, which can lead to more volatile sales patterns due to project scheduling uncertainty. Operating results for the Architectural Specialties segment include a minor portion of allocated Corporate administrative expenses that represent a reasonable allocation of general services to support its operations.

*Unallocated Corporate* - includes assets, liabilities, income and expenses that have not been allocated to our other business segments and consist of: cash and cash equivalents, the net funded status of our U.S. Retirement Income Plan (“RIP”), the estimated fair value of interest rate swap contracts, outstanding borrowings under our senior credit facility and income tax balances. Our Unallocated Corporate segment also includes all assets, liabilities, income and expenses formerly reported in our EMEA and Pacific Rim segments that were not included in the Sale.

### **Factors Affecting Revenues**

For information on our segments’ 2019 net sales by geography, see Note 3 to the Consolidated Financial Statements included in this Form 10-K.

*Markets.* We compete in the commercial and residential construction markets. We closely monitor publicly available macroeconomic trends that provide insight into commercial and residential market activity, including GDP, office vacancy rates, the Architecture Billings Index, new commercial construction starts, state and local government spending, corporate profits and retail sales.

We noted several factors and trends within our markets that directly affected our business performance during 2019. In our Mineral Fiber segment, softer demand for lower end products exceeded increased demand for high end products. In our Architectural Specialties segment, we experienced strong growth due to the impact of the 2018 acquisitions of Plasterform and Steel Ceilings (collectively, the “2018 Acquisitions”) and the 2019 acquisitions of ACGI and MRK (collectively, the “2019 Acquisitions”). Our Architectural Specialties segment also experienced increased market penetration as a result of an expanded range of product offerings, and new construction activity.

The following table presents the impact of the 2018 Acquisitions and the 2019 Acquisitions on our Architectural Specialties segment (dollar amounts in millions):

	Net sales	
	2019	2018
2018 Acquisitions	\$ 21.4	\$ 8.6
2019 Acquisitions	24.3	-
Total	\$ 45.7	\$ 8.6

*Average Unit Value.* We periodically modify sales prices of our products due to changes in costs for raw materials and energy, market conditions and the competitive environment. In certain cases, realized price increases are less than the announced price increases because of project pricing, competitive reactions and changing market conditions. We also offer a wide assortment of products that are differentiated by style, design and performance attributes. Pricing and margins for products within the assortment vary. In addition, changes in the relative quantity of products purchased at different price points can impact year-to-year comparisons of net sales and operating income. Within our Mineral Fiber segment, we focus on improving sales dollars per unit sold, or average unit value (“AUV”), as a measure that accounts for the varying assortment of products impacting our revenues. We estimate that favorable AUV increased our Mineral Fiber and total consolidated net sales for 2019 by approximately \$44 million compared to 2018. Our Architectural Specialties segment generates revenues that are generally earned based on individual contracts that include a mix of products, both manufactured by us and sourced from third parties that vary by project. As such, we do not track AUV performance for this segment, but rather attribute all changes in sales to volume.

In the first and third quarters of 2019, we implemented price increases on certain Mineral Fiber ceiling tile and Architectural Specialties products. In the fourth quarter of 2019, we announced a price increase on Mineral Fiber ceiling tile and grid products to be effective in the first quarter of 2020. We may implement future pricing actions based on numerous factors.

*Seasonality.* Generally, our sales tend to be stronger in the second and the third quarters of our fiscal year due to more favorable weather conditions, customer business cycles and the timing of renovation and new construction.

### **Factors Affecting Operating Costs**

*Operating Expenses.* Our operating expenses are comprised of direct production costs (principally raw materials, labor and energy), manufacturing overhead costs, freight, costs to purchase sourced products and selling, general, and administrative ("SG&A") expenses.

Our largest individual raw material expenditures are for fiberglass, perlite, starch, waste paper, wood, wood fiber, aluminum, steel, pigments and clays. We manufacture most of the production needs for mineral wool at one of our manufacturing facilities. Natural gas and packaging materials are also significant input costs. Fluctuations in the prices of these inputs are generally beyond our control and have a direct impact on our financial results. In 2019, costs for raw materials and energy negatively impacted operating income by \$1 million, compared to 2018.

### **CRITICAL ACCOUNTING ESTIMATES**

In preparing our consolidated financial statements in accordance with U.S. generally accepted accounting principles ("GAAP"), we are required to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. We evaluate our estimates and assumptions on an on-going basis, using relevant internal and external information. We believe that our estimates and assumptions are reasonable. However, actual results may differ from what was estimated and could have a significant impact on the financial statements.

We have identified the following as our critical accounting estimates. We have discussed these critical accounting estimates with our Audit Committee.

U.S. Pension Credit and Postretirement Benefit Costs – We maintain significant pension and postretirement plans in the U.S. Our defined benefit pension and postretirement benefit costs are developed from actuarial valuations. These valuations are calculated using a number of assumptions, which represent management's best estimate of the future. The assumptions that have the most significant impact on reported results are the discount rate, the estimated long-term return on plan assets and the estimated inflation in health care costs. These assumptions are generally updated annually.

Management utilizes the Aon Hewitt AA only above median yield curve, which is a hypothetical AA yield curve comprised of a series of annualized individual discount rates, as the primary basis for determining discount rates. As of December 31, 2019 and 2018, we assumed discount rates of 3.16% and 4.30%, respectively, for the U.S. defined benefit pension plans. As of December 31, 2019 and 2018, we assumed a discount rates of 3.14% and 4.31%, respectively, for the U.S. postretirement plan. The effects of the change in discount rate will be amortized into earnings as described below. Absent any other changes, a one-quarter percentage point increase or decrease in the discount rates for the U.S. pension and postretirement plans would not have a material impact on 2020 operating or non-operating income.

We manage two U.S. defined benefit pension plans, our RIP, which is a qualified funded plan, and a nonqualified unfunded plan. For the RIP, the expected long-term return on plan assets represents a long-term view of the future estimated investment return on plan assets. This estimate is determined based on the target allocation of plan assets among asset classes and input from investment professionals on the expected performance of the asset classes over 10 to 30 years. Historical asset returns are monitored and considered when we develop our expected long-term return on plan assets. An incremental component is added for the expected return from active management based on historical information obtained from the plan's investment consultants. These forecasted gross returns are reduced by estimated management fees and expenses. Over the 10-year period ended December 31, 2019, the historical annualized return was approximately 7.9% compared to an average expected return of 6.5%. The actual gain on plan assets incurred for 2019 was 16.6%, net of fees. The difference between the actual and expected rate of return on plan assets will be amortized into earnings as described below.

The expected long-term return on plan assets used in determining our 2019 U.S. pension cost was 5.75%. We have assumed a return on plan assets for 2020 of 5.25%. The 2020 expected return on assets was calculated in a manner consistent with 2019. A one-quarter percentage point increase or decrease in this assumption would increase or decrease 2020 non-operating income by approximately \$3.7 million.

Contributions to the unfunded pension plan were \$4.0 million in 2019 and were made on a monthly basis to fund benefit payments. We estimate the 2020 contributions will be approximately \$3.9 million. See Note 18 to the Consolidated Financial Statements for more information.



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The estimated inflation in health care costs represents a 5-10 year view of the expected inflation in our postretirement health care costs. We separately estimate expected health care cost increases for pre-65 retirees and post-65 retirees due to the influence of Medicare coverage at age 65, as illustrated below:

	Assumptions		Actual	
	Post-65	Pre-65	Post-65	Pre-65
2018	9.2%	8.0%	9.0%	2.5%
2019	8.7%	7.6%	(9.7)%	24.8%
2020	8.2%	7.2%		

The difference between the actual and expected health care costs is amortized into earnings as described below. As of December 31, 2019, health care cost increases are estimated to decrease ratably until 2026, after which they are estimated to be constant at 4.50%. A one percentage point increase or decrease in the assumed health care cost trend rate would not have a material impact on 2020 operating or non-operating income. See Note 18 to the Consolidated Financial Statements for more information.

Actual results that differ from our various pension and postretirement plan estimates are captured as actuarial gains/losses. When certain thresholds are met, the gains and losses are amortized into future earnings over the remaining life expectancy of participants. Changes in assumptions could have significant effects on earnings in future years.

Total net actuarial losses related to our U.S. pension benefit plans decreased by \$36.6 million in 2019 primarily due to a better than expected return on assets, partially offset by changes in actuarial assumptions (most significantly a 114 basis point decrease in the discount rate). The \$36.6 million actuarial gain impacting our U.S. pension plans is reflected as a component of other comprehensive income in our Consolidated Statement of Earnings and Comprehensive Income along with actuarial gains and losses from our foreign pension plan and our U.S. postretirement benefit plan.

On February 20, 2020, we entered into a commitment agreement with a third-party insurance company to partially settle approximately \$1.0 billion of retiree benefit obligations under our RIP. See Note 18 to the Consolidated Financial Statements for further information.

Income Taxes – Our effective tax rate is primarily determined based on our pre-tax income, statutory income tax rates in the jurisdictions in which we operate, and the tax impacts of items treated differently for tax purposes than for financial reporting purposes. Some of these differences are permanent, such as expenses that are not deductible in our tax returns, and some differences are temporary, reversing over time, such as depreciation expense. These temporary differences create deferred income tax assets and liabilities. Deferred income tax assets are also recorded for net operating losses (“NOL”), capital loss carryforwards, and foreign tax credit (“FTC”) carryforwards.

Deferred income tax assets and liabilities are recognized by applying enacted tax rates to temporary differences that exist as of the balance sheet date. We reduce the carrying amounts of deferred tax assets by a valuation allowance if, based on the available evidence, it is more likely than not that such assets will not be realized. The need to establish valuation allowances for deferred tax assets is assessed quarterly. In assessing the requirement for, and amount of, a valuation allowance in accordance with the more likely than not standard, we give appropriate consideration to all positive and negative evidence related to the realization of the deferred tax assets. This assessment considers, among other matters, the nature, frequency and severity of current and cumulative losses, forecasts of future profitability, capital gain income, and foreign source income (“FSI”), the duration of statutory carryforward periods, and our experience with operating loss and tax credit carryforward expirations. A history of cumulative losses is a significant piece of negative evidence used in our assessment. If a history of cumulative losses is incurred for a tax jurisdiction, forecasts of future profitability are not used as positive evidence related to the realization of the deferred tax assets in the assessment.

As of December 31, 2019, we have recorded valuation allowances totaling \$75.5 million for various federal and state deferred tax assets. While we have considered future taxable income in assessing the need for the valuation allowances based on our best available projections, if these estimates and assumptions change in the future or if actual results differ from our projections, we may be required to adjust our valuation allowances accordingly. Such adjustments could be material to our Consolidated Financial Statements.

As further described in Note 16 to the Consolidated Financial Statements, our Consolidated Balance Sheet as of December 31, 2019 includes deferred income tax assets of \$155.8 million. Included in this amount are deferred federal income tax assets for FTC carryforwards of \$13.1 million, federal and state capital loss carryforwards of \$16.0 million, and state NOL deferred income tax assets of \$54.8 million. We have established valuation allowances in the amount of \$75.5 million consisting of \$13.1 million for federal deferred tax assets related to FTC carryovers, \$46.4 million for state deferred tax assets, primarily operating loss carryovers, and \$16.0 million for federal and state deferred tax assets related to capital loss carryovers. Inherent in determining our effective tax rate are

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judgments regarding business plans and expectations about future operations. These judgments include the amount and geographic mix of future taxable income, the amount of FSI, limitations on usage of NOL carryforwards, the impact of ongoing or potential tax audits, and other future tax consequences.

We estimate we will need to generate future U.S. taxable income of approximately \$681.6 million for state income tax purposes during the respective realization periods (ranging from 2020 to 2039) in order to fully realize the net state NOL deferred income tax assets.

Our ability to utilize deferred tax assets may be impacted by certain future events, such as changes in tax legislation and insufficient future taxable income prior to expiration of certain deferred tax assets.

We recognize the tax benefits of an uncertain tax position if those benefits are more likely than not to be sustained based on existing tax law. Additionally, we establish a reserve for tax positions that are more likely than not to be sustained based on existing tax law, but uncertain in the ultimate benefit to be sustained upon examination by the relevant taxing authorities. Unrecognized tax benefits are subsequently recognized at the time the more likely than not recognition threshold is met, the tax matter is effectively settled or the statute of limitations for the relevant taxing authority to examine and challenge the tax position has expired, whichever is earlier.

Impairments of Long-Lived Tangible, Intangible Assets and Goodwill – Our indefinite-lived assets include goodwill and other intangibles, primarily trademarks and brand names. Trademarks and brand names are integral to our corporate identity and expected to contribute indefinitely to our corporate cash flows. Accordingly, they have been assigned an indefinite life. We conduct our annual impairment tests for these indefinite-lived intangible assets and goodwill during the fourth quarter. These assets undergo more frequent tests if an indication of possible impairment exists. We conduct impairment tests for tangible assets and definite-lived intangible assets when indicators of impairment exist, such as operating losses and/or negative cash flows.

In connection with the performance of an impairment test for tangible assets and definite-lived intangible assets, we compare the carrying amount of the asset group to the estimated undiscounted future cash flows expected to be generated by the assets. If the undiscounted cash flows of the asset group/reporting unit are less than the carrying value, an estimate of an asset group's/reporting unit's fair value is based on discounted future cash flows expected to be generated by the asset group/reporting unit, or based on management's estimated exit price assuming the assets could be sold in an orderly transaction between market participants or estimated salvage value if no sale is assumed. If the fair value is less than the carrying value of the asset group/reporting unit, we record an impairment charge equal to the difference between the fair value and carrying value of the asset group/reporting unit.

In connection with the performance of an impairment test for indefinite-lived intangible assets and goodwill, we compare the carrying amount of the asset (when testing indefinite-lived intangible assets) and reporting unit (when testing goodwill) to the estimated fair value. For indefinite-lived intangible assets, the estimated fair value is based on discounted future cash flows using the relief from royalty method. For goodwill, the estimated fair value is based on discounted future cash flows expected to be generated by the reporting unit. If the fair value is less than the carrying value of the asset/reporting unit, we record an impairment charge equal to the difference between the fair value and carrying value of the asset/reporting unit.

The principal assumptions used in our impairment tests for definite-lived intangible assets is operating profit adjusted for depreciation and amortization and, if required to estimate the fair value, the discount rate. The principal assumptions used in our impairment tests for indefinite-lived intangible assets include revenue growth rate, discount rate and royalty rate. The principal assumptions utilized in our impairment tests for goodwill include after-tax cash flows growth rates and discount rate. Revenue growth rates, after-tax cash flows growth rates and operating profit assumptions are derived from those used in our operating plan and strategic planning processes. The discount rate assumption is calculated based upon an estimated weighted average cost of capital which reflects the overall level of inherent risk and the rate of return a market participant would expect to achieve. The royalty rate assumption represents the estimated contribution of the intangible assets to the overall profits of the related businesses.

In 2019, indefinite-lived intangibles and goodwill were tested for impairment based on our identified asset groups/reporting units. There were no material impairment charges recorded in 2019, 2018 or 2017 related to intangible assets. We did not test tangible assets within our continuing operations for impairment in 2019, 2018 or 2017 as no indicators of impairment existed.

The cash flow estimates used in applying our impairment tests are based on management's analysis of information available at the time of the impairment test. Actual cash flows lower than the estimate could lead to significant future impairments. If subsequent testing indicates that fair values have declined, the carrying values would be reduced and our future statements of income would be affected.

## Management's Discussion and Analysis of Financial Condition and Results of Operations

We cannot predict the occurrence of certain events that might lead to material impairment charges in the future. Such events may include, but are not limited to, the impact of economic environments, particularly related to the commercial and residential construction industries, material adverse changes in relationships with significant customers, or strategic decisions made in response to economic and competitive conditions. See Notes 3 and 13 to the Consolidated Financial Statements for further information.

**Environmental Liabilities** – We are actively involved in the investigation, closure and/or remediation of existing or potential environmental contamination under the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”), and state Superfund and similar type environmental laws at several domestically owned, formerly owned and non-owned locations allegedly resulting from past industrial activity. In a few cases, we are one of several potentially responsible parties and have agreed to jointly fund the required investigation, while preserving our defenses to the liability. We may also have rights of contribution or reimbursement from other parties or coverage under applicable insurance policies.

We provide for environmental remediation costs and penalties when the responsibility to remediate is probable and the amount of associated costs is reasonably determinable. Accruals are estimates based on the judgment of management related to ongoing proceedings. Estimates of our future liability at the environmental sites are based on evaluations of currently available facts regarding each individual site. In determining the probability of contribution, we consider the solvency of other parties, the site activities of other parties, whether liability is being disputed, the terms of any existing agreements and experience with similar matters, and the effect of our October 2006 Chapter 11 reorganization upon the validity of the claim.

We evaluate the measurement of recorded liabilities each reporting period based on current facts and circumstances specific to each matter. The ultimate losses incurred upon final resolution may materially differ from the estimated liability recorded. Changes in estimates are recorded in earnings in the period in which such changes occur.

We are unable to predict the extent to which any recoveries from other parties or coverage under insurance policies might cover our final share of costs for these sites. Our final share of investigation and remediation costs may exceed any such recoveries, and such amounts net of insurance recoveries may be material.

### **ACCOUNTING PRONOUNCEMENTS EFFECTIVE IN FUTURE PERIODS**

See Note 2 to the Consolidated Financial Statements for further information.

### **RESULTS OF OPERATIONS**

This section of this Form 10-K generally discusses 2019 and 2018 items and year-to-year comparisons between 2019 and 2018. Discussions of 2017 items and year-to-year comparisons between 2018 and 2017 that are not included in this Form 10-K can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2018.

Unless otherwise indicated, net sales in these results of operations are reported based upon the AWI location where the sale was made. Please refer to Notes 3 and 6 to the Consolidated Financial Statements for a reconciliation of segment operating income to consolidated earnings from continuing operations before income taxes and additional financial information related to discontinued operations.

#### **2019 COMPARED TO 2018**

##### **CONSOLIDATED RESULTS FROM CONTINUING OPERATIONS**

(dollar amounts in millions)

	<u>2019</u>	<u>2018</u>	<u>Change is Favorable</u>
Total consolidated net sales	\$ 1,038.1	\$ 975.3	6.4%
Operating income	\$ 317.4	\$ 249.4	27.3%

Consolidated net sales increased due to favorable AUV of \$44 million and higher volumes of \$19 million. Mineral Fiber net sales increased by \$25 million and Architectural Specialties net sales increased by \$38 million.

Cost of goods sold was 61.9% of net sales in 2019, compared to 65.8% in 2018. The decrease in cost of goods sold as a percent of net sales in comparison to 2018 was driven primarily by a \$27 million reduction in cost of goods sold due to savings from the closure of

## Management's Discussion and Analysis of Financial Condition and Results of Operations

our St. Helens manufacturing plant during the second quarter of 2018, combined with the absence of accelerated depreciation and related costs attributable to the closed facility, and increased price realization in excess of inflation.

SG&A expenses in 2019 were \$174.3 million, or 16.8% of net sales, compared to \$159.0 million, or 16.3% of net sales, in 2018. The increase in SG&A expenses was primarily due to a \$13 million increase in legal and professional fees, including expenses and attorney's fees paid under our litigation settlement agreement with Roxul USA, Inc. ("Rockfon"). Also contributing to the increase in SG&A expenses was the impact of the 2018 Acquisitions and the 2019 Acquisitions. Partially offsetting the impact of these increases in SG&A expenses was \$5 million of cost reimbursements, net of expenses, earned in 2019 under our Transition Services Agreement with Knauf and a \$4 million reduction in share-based compensation expense.

Equity earnings from our WAVE joint venture were \$96.6 million in 2019, compared to \$74.9 million in 2018. During 2019 and as a result of the Sale, we recorded a \$21 million increase in WAVE equity earnings, representing our share of WAVE's gain on sale of its discontinued European and Pacific Rim businesses, net of a \$4 million write-off related to our WAVE fresh-start reporting for customer relationship and developed technology intangible assets. Excluding the impact of our portion of WAVE's gain on the Sale and the write-off, WAVE equity earnings increased as a result of increases in AUV, partially offset by investments in manufacturing and lower volumes. Negatively impacting WAVE equity earnings for 2019 was a \$1 million partial pension settlement charge. See Note 11 to the Consolidated Financial Statements for further information.

Interest expense was \$38.4 million in 2019, compared to \$39.2 million in 2018. The decrease in interest expense in 2019 was driven primarily by lower interest rates and the refinancing of our credit facility on September 30, 2019. In connection with the refinancing, we wrote off \$2.7 million of unamortized debt financing costs, included as a component of interest expense, related to our previous credit facility.

Other non-operating income was \$20.4 million in 2019, compared to \$32.5 million in 2018. The decrease was primarily related to lower credits from non-service cost components associated with our RIP. See Note 18 to the Consolidated Financial Statements for further information.

Income tax expense was \$57.1 million in 2019, compared to \$53.1 million in 2018. The effective tax rate for 2019 was 19.1% as compared to a rate of 21.9% for 2018. The effective tax rate was lower in 2019 as a result of our share of WAVE's gain on sale of its EMEA and Pacific Rim businesses having no related income tax expense, in addition to a favorable impact of state deferred tax asset adjustments.

Total other comprehensive income (loss) ("OCI") was \$83.4 million of income in 2019, compared to a \$59.4 million loss for 2018. The change was driven by \$83.8 million of Accumulated Other Comprehensive Income ("AOCI") adjustments related primarily to foreign currency translation adjustments that were reclassified out of AOCI concurrent with the Sale. Foreign currency translation adjustments represent the change in the U.S. dollar value of assets and liabilities denominated in foreign currencies. Also impacting the change in OCI in both periods was pension and postretirement adjustments and derivative losses. Pension and postretirement adjustments represent the amortization of actuarial gains and losses related to our defined benefit pension and postretirement plans. Derivative gain/loss represents the mark-to-market value adjustments of our derivative assets and liabilities and the recognition of gains and losses previously deferred in OCI.

### **REPORTABLE SEGMENT RESULTS**

#### **Mineral Fiber**

(dollar amounts in millions)

	<u>2019</u>	<u>2018</u>	<u>Change is Favorable</u>
Total segment net sales	\$ 826.6	\$ 801.6	3.1%
Operating income	\$ 289.6	\$ 223.8	29.4%

Net sales increased due to favorable AUV of \$44 million, partially offset by lower volumes of \$19 million. The favorable AUV was due to favorable price and improved mix from the sale of higher end ceiling tile products.

Operating income increased due primarily to a \$21 million increase in WAVE equity earnings relating to the Sale. Also contributing to the increase was \$31 million of favorable AUV and a \$27 million increase in operating income due to savings from the closure of our St. Helens manufacturing plant during the second quarter of 2018, combined with the absence of accelerated depreciation and related costs attributable to the closed facility. Partially offsetting the operating income increase was a \$13 million increase in costs

## Management's Discussion and Analysis of Financial Condition and Results of Operations

associated with the Rockfon litigation settlement, a \$12 million negative impact from lower volumes, \$5 million of cost reimbursements, net of related expenses, earned in 2019 under our Transition Services Agreement with Knauf, and a \$4 million reduction in share-based compensation expense.

### Architectural Specialties

(dollar amounts in millions)

	<u>2019</u>	<u>2018</u>	<u>Change is Favorable</u>
Total segment net sales	\$ 211.5	\$ 173.7	21.8%
Operating income	\$ 35.9	\$ 34.3	4.7%

Net sales increased due to the full year impact of the 2018 Acquisitions, and the 2019 Acquisitions (see table in Factors Affecting Revenue), in addition to higher volumes from increased market penetration as a result of an expanded range of product offerings, and new construction activity.

Operating income increased due to the positive impact of higher sales volume, partially offset by additional investments in selling and design capacities and intangible asset amortization expense related to the 2018 Acquisitions and the 2019 Acquisitions.

### Unallocated Corporate

Unallocated Corporate expense of \$8 million decreased from \$9 million in the prior year primarily due to lower service cost associated with our RIP.

## FINANCIAL CONDITION AND LIQUIDITY

### Cash Flow

The discussion that follows includes cash flows related to discontinued operations, primarily operations sold in the Sale.

Operating activities for 2019 provided \$182.7 million of cash, compared to \$203.2 million of cash provided in 2018. The decrease was primarily due to an increase in working capital, most notably a decrease in receipts of environmental insurance settlements, partially offset by higher cash earnings.

Net cash used for investing activities was \$89.1 million for 2019, compared to \$309.6 million of cash provided in 2018. The decrease resulted primarily from \$47.9 million of payments to Knauf as a result of the Sale combined with the absence of \$330.0 million of proceeds received from Knauf in 2018 related to the sale of our EMEA and Pacific Rim businesses, partially offset by \$70.0 million of payments to WAVE. Also contributing to the decrease was the cash paid for the acquisitions of ACGI and MRK, and a decrease in dividends from our WAVE joint venture.

Net cash used for financing activities was \$384.9 million in 2019, compared to \$329.3 million in 2018. The unfavorable change in use of cash was primarily due to higher net debt payments as a result of our September 2019 debt refinancing, higher share tax withholdings from employee stock awards and the payment of dividends, partially offset by a lower repurchases of outstanding common stock.

### Liquidity

Our liquidity needs for operations vary throughout the year. We retain lines of credit to facilitate our seasonal cash flow needs, since cash flow is generally lower during the first and fourth quarters of our fiscal year.

As of June 30, 2019, total debt outstanding under our \$1,050.0 million variable rate senior credit facility was \$525.0 million under Term Loan A and \$241.9 million under Term Loan B, with no borrowings outstanding under the revolving credit facility. On July 3, 2019, we used cash on hand to make a voluntary prepayment of \$100.0 million of the debt outstanding under Term Loan B. Term Loan B was priced at 2.75% over the London Interbank Offered Rate ("LIBOR"). On September 30, 2019, we refinanced our \$1,050.0 million variable rate senior credit facility, using cash on hand to pay down a portion of the debt outstanding, including the debt outstanding under Term Loan B. The \$1,000.0 million amended senior credit facility is composed of a \$500.0 million revolving credit facility (with a \$150.0 million sublimit for letters of credit) and a \$500.0 million Term Loan A. The terms of the amended credit facility resulted in a lower interest rate spread for both the revolving credit facility (2.00% to 1.50% over LIBOR) and Term Loan A (1.75% to 1.50% over LIBOR). We also extended the maturity of both the revolving credit facility and Term Loan A from April 2021

## Management's Discussion and Analysis of Financial Condition and Results of Operations

to September 2024. The \$1,000.0 million senior credit facility is secured by the capital stock of material U.S. subsidiaries and a pledge of 65% of the stock of our material first-tier foreign subsidiaries, primarily Canada. The unpaid balances of the revolving credit facility and Term Loan A may be prepaid without penalty at the maturity of their respective interest reset periods. Any principal amounts paid on the Term Loan A may not be re-borrowed.

As of December 31, 2019, total borrowings outstanding under our senior credit facility were \$115.0 million under the revolving credit facility and \$500.0 million under Term Loan A.

The refinanced senior credit facility includes two financial covenants that require the ratio of consolidated earnings before interest, taxes, depreciation and amortization ("EBITDA") to consolidated cash interest expense minus cash consolidated interest income to be greater than or equal to 3.0 to 1.0 and requires the ratio of consolidated funded indebtedness, minus AWI and domestic subsidiary unrestricted cash and cash equivalents up to \$100 million, to EBITDA to be less than or equal to 3.75 to 1.0. As of December 31, 2019, we were in compliance with all covenants of the senior credit facility.

The Term Loan A is fully drawn and is currently priced on a variable interest rate basis. The following table summarizes our interest rate swaps (dollar amounts in millions):

Trade Date	Notional Amount	Coverage Period	Risk Coverage
November 13, 2016	\$ 200.0	November 2016 to March 2021	USD-LIBOR
November 28, 2018	\$ 200.0	November 2018 to November 2023	USD-LIBOR
November 28, 2018	\$ 100.0	March 2021 to March 2025	USD-LIBOR

Under the terms of the November 2016 swap maturing in 2021, we receive 3-month LIBOR and pay a fixed rate over the hedged period, in addition to a basis rate swap to convert the floating rate risk under our November 2016 swap from 3-month LIBOR to 1-month LIBOR. As a result, we receive 1-month LIBOR and pay a fixed rate over the hedged period.

Under the terms of the November 2018 swap maturing in 2023, we pay a fixed rate over the hedged amount and receive a 1-month LIBOR. This is inclusive of a 0% floor.

Under the terms of the forward starting November 2018 swap maturing in 2025, we will pay a fixed rate monthly and receive 1-month LIBOR. This is inclusive of a 0% floor.

These swaps are designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt.

During the fourth quarter of 2019, we used proceeds from our revolving credit facility to pay off a \$35.0 million variable rate, tax exempt industrial development bond that financed the construction of a plant in prior years. The bond was remarketed by an agent on a regular basis at a market-clearing interest rate.

As of December 31, 2019, we had \$45.3 million of cash and cash equivalents, \$29.8 million in the U.S and \$15.5 million in various foreign jurisdictions, primarily Canada.

As of December 31, 2019, we had a \$36.2 million Accounts Receivable Securitization Facility with the Bank of Nova Scotia (the "funding entity") that matures in March 2020. Under this facility, we sell accounts receivables to Armstrong Receivables Company, LLC ("ARC"), a Delaware entity that is consolidated in these financial statements. ARC is a 100% wholly-owned single member limited liability company special purpose entity created specifically for this transaction; therefore, any receivables sold to ARC are not available to the general creditors of AWI. ARC then sells an undivided interest in the purchased accounts receivables to the funding entity. This undivided interest acts as collateral for drawings on the facility. Any borrowings under this facility are obligations of ARC and not AWI. ARC contracts with and pays a servicing fee to AWI to manage, collect and service the purchased accounts receivables. All new receivables under the program are continuously purchased by ARC with the proceeds from collections of receivables previously purchased. During the first quarter of 2020, we expect to amend the facility to reduce the purchase limit from \$36.2 million to \$30.0 million and to extend its maturity to March 2021.

## Management's Discussion and Analysis of Financial Condition and Results of Operations

We utilize lines of credit and other commercial commitments in order to ensure that adequate funds are available to meet operating requirements. Letters of credit are currently arranged through our revolving credit facility, our bi-lateral facility and our securitization facility. Letters of credit may be issued to third party suppliers, insurance and financial institutions and typically can only be drawn upon in the event of AWI's failure to pay its obligations to the beneficiary. The following table presents details related to our letters of credit (dollar amounts in millions):

<u>Financing Arrangements</u>	<u>December 31, 2019</u>		
	<u>Limit</u>	<u>Used</u>	<u>Available</u>
Accounts receivable securitization facility	\$ 36.2	\$ -	\$ 36.2
Bi-lateral facility	25.0	11.4	13.6
Revolving credit facility	150.0	-	150.0
Total	<u>\$ 211.2</u>	<u>\$ 11.4</u>	<u>\$ 199.8</u>

As of December 31, 2019, there was no restricted cash under our accounts receivable securitization facility for letters of credit issued in excess of our maximum limit. As of December 31, 2018, \$6.0 million of letters of credit issued under our accounts receivable securitization facility in excess of our maximum limit was classified as restricted cash and reported as a component of Cash and cash equivalents on our Consolidated Balance Sheets.

We believe that cash on hand and cash generated from operations, together with lines of credit, availability under our revolving credit facility, will be adequate to address our foreseeable liquidity needs based on current expectations of our business operations, capital expenditures and scheduled payments of debt obligations.

### OFF-BALANCE SHEET ARRANGEMENTS

No disclosures are required pursuant to Item 303(a)(4) of Regulation S-K.

### CONTRACTUAL OBLIGATIONS

As part of our normal operations, we enter into numerous contractual obligations that require specific payments during the term of the various agreements. The following table includes amounts ongoing under contractual obligations existing as of December 31, 2019. Only known payments that are dependent solely on the passage of time are included. Obligations under contracts that contain minimum payment amounts are shown at the minimum payment amount. Contracts that contain variable payment structures without minimum payments are excluded. Purchase orders that are entered into in the normal course of business are also excluded because they are generally cancelable and not legally binding. Amounts are presented below based upon the currently scheduled payment terms. Actual future payments may differ from the amounts presented below due to changes in payment terms or events affecting the payments.

<u>(dollar amounts in millions)</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Thereafter</u>	<u>Total</u>
Long-term debt <sup>(1)</sup>	\$ 6.3	\$ 25.0	\$ 25.0	\$ 25.0	\$ 533.7	\$ -	\$ 615.0
Scheduled interest payments <sup>(2)</sup>	18.5	19.4	18.8	17.8	11.6	0.3	86.4
Operating lease obligations, net of sublease income <sup>(3)</sup>	6.6	5.8	5.1	4.4	3.6	17.5	43.0
Unconditional purchase obligations <sup>(4)</sup>	23.6	9.9	4.2	1.2	0.2	-	39.1
Pension contributions <sup>(5)</sup>	3.9	3.8	3.7	3.6	3.5	-	18.5
Total contractual obligations	<u>\$ 58.9</u>	<u>\$ 63.9</u>	<u>\$ 56.8</u>	<u>\$ 52.0</u>	<u>\$ 552.6</u>	<u>\$ 17.8</u>	<u>\$ 802.0</u>

(1) Excludes \$4.2 million of unamortized debt financing costs as of December 31, 2019.

(2) For debt with variable interest rates and interest rate swaps, we projected future interest payments based on market-based interest rate swap curves.

(3) Lease obligations include the undiscounted lease payments due under existing agreements with non-cancelable lease terms in excess of one year. Reasonably certain renewal periods are included and non-lease components are excluded.

(4) Unconditional purchase obligations include (a) purchase contracts whereby we must make guaranteed minimum payments of a specified amount regardless of how little material is actually purchased ("take or pay" contracts) and (b) service agreements. Unconditional purchase obligations exclude contracts entered into during the normal course of business that are non-cancelable and have fixed per unit fees, but where the monthly commitment varies based upon usage. Cellular phone contracts are an example.

Management’s Discussion and Analysis of Financial Condition and Results of Operations

- (5) Pension contributions include estimated contributions for our unfunded U.S. Retirement Benefit Equity Plan. We are not presenting estimated payments in the table above beyond 2024 as funding can vary from year to year based upon changes in funding regulations and actuarial assumptions.

The table above excludes \$34.7 million of unrecognized tax benefit liabilities under ASC 740 “Income Taxes.” Due to the uncertainty relating to these positions, we are unable to reasonably estimate the ultimate amount or timing of the settlement of these issues. See Note 16 to the Consolidated Financial Statements for more information.

This table excludes obligations related to postretirement benefits (retiree health care and life insurance) since we voluntarily provide these benefits. The amount of benefit payments we made in 2019 was \$9.4 million. See Note 18 to the Consolidated Financial Statements for additional information regarding future expected cash payments for postretirement benefits.

Letters of credit are currently arranged through our bi-lateral facility. Letters of credit may be issued to third party suppliers, insurance and financial institutions and typically can only be drawn upon in the event of AWI’s failure to pay its obligations to the beneficiary. The following table summarizes the commitments we have available for use as of December 31, 2019.

<b>Other Commercial Commitments</b> (dollar amounts in millions)	<b>Total Amounts Committed</b>	<b>Less Than 1 Year</b>	<b>1 – 3 Years</b>	<b>4 – 5 Years</b>	<b>Over 5 Years</b>
Letters of credit	\$ 11.4	\$ 11.4	\$ -	\$ -	\$ -

In connection with our disposition of certain assets through a variety of unrelated transactions, we have entered into contracts that included various indemnity provisions, some of which are customary for such transactions, while others hold the acquirer of the assets harmless with respect to liabilities relating to such matters as taxes, environmental and other litigation. Some of these provisions include exposure limits, but many do not. Due to the nature of the indemnities, it is not possible to estimate the potential maximum exposure under these contractual provisions. As of December 31, 2019, we had no liabilities recorded for which an indemnity claim had been received.



## **ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK**

### **Market Risk**

Our primary exposure to market risk is from changes in interest rates that could impact our results of operations, cash flows and financial condition. We use forward swap contracts to hedge these exposures. The Company utilizes derivative financial instruments as risk management tools and not for speculative trading purposes. In addition, derivative financial instruments are entered into with a diversified group of major financial institutions in order to manage our exposure to potential nonperformance on such instruments. We regularly monitor developments in the capital markets.

In July 2017, the Financial Conduct Authority (the authority that regulates LIBOR) announced it intends to replace LIBOR rates with the Secured Overnight Financing Rate ("SOFR") effective in late 2021. The Alternative Reference Rates Committee ("ARRC") has proposed that the SOFR rate that represents best practice as the alternative to USD-LIBOR for use in derivatives and other financial contracts that are currently indexed to USD-LIBOR. ARRC has proposed a paced market transition plan to SOFR from USD-LIBOR and organizations are currently working on industry wide and company specific transition plans as it relates to derivatives and cash markets exposed to USD-LIBOR. The Company will monitor the new SOFR rates and regulation related to our debt, interest rate hedging instruments and other contracts that are indexed to USD-LIBOR.

### **Counterparty Risk**

We only enter into derivative transactions with established financial institution counterparties having an investment-grade credit rating. We monitor counterparty credit default swap levels and credit ratings on a regular basis. All of our derivative transactions with counterparties are governed by master International Swap and Derivatives Association agreements ("ISDAs") with netting arrangements. These agreements can limit our exposure in situations where we have gain and loss positions outstanding with a single counterparty. We do not post nor do we receive cash collateral with any counterparty for our derivative transactions. These ISDAs do not have any credit contingent features; however, a default under our bank credit facility would trigger a default under these agreements. Exposure to individual counterparties is controlled and we consider the risk of counterparty default to be negligible.

### **Interest Rate Sensitivity**

We are subject to interest rate variability on our Term Loan A and revolving credit facility. A hypothetical increase of one-quarter percentage point in LIBOR interest rates from December 31, 2019 levels would increase 2020 interest expense by approximately \$2.2 million. We also have \$400.0 million of active interest rate swaps outstanding, which fix the interest rates for a portion of our debt. These active interest rate swaps are included in this calculation.

As of December 31, 2019, we had interest rate swaps outstanding on Term Loan A, with notional amounts of \$500.0 million. We utilize interest rate swaps to minimize the fluctuations in earnings caused by interest rate volatility. Under the terms of the Term Loan A swaps we receive 1-month LIBOR and pay a fixed rate over the hedged period. The following table summarizes our interest rate swaps as of December 31, 2019 (dollar amounts in millions):

<u>Trade Date</u>	<u>Notional Amount</u>	<u>Coverage Period</u>	<u>Risk Coverage</u>
November 13, 2016	\$ 200.0	November 2016 to March 2021	USD-LIBOR
November 28, 2018	\$ 200.0	November 2018 to November 2023	USD-LIBOR
November 28, 2018	\$ 100.0	March 2021 to March 2025	USD-LIBOR

These swaps are designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt. The net liability measured at fair value was \$14.3 million at December 31, 2019.

The table below provides information about our long-term debt obligations as of December 31, 2019, including payment requirements and related weighted-average interest rates by scheduled maturity dates. Weighted average variable rates are based on implied forward rates in the yield curve and are exclusive of our interest rate swaps.

<u>Scheduled maturity date (dollar amounts in millions)</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>After 2025</u>	<u>Total</u>
Variable rate principal payments	\$ 6.3	\$ 25.0	\$ 25.0	\$ 25.0	\$ 533.7	\$ -	\$ 615.0
Average interest rate	3.15%	3.07%	3.11%	3.18%	2.51%	-	2.59%

Variable rate principle payments reflected in the preceding table exclude \$4.2 million of unamortized debt financing costs as of December 31, 2019.

**ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA**

**SUPPLEMENTARY DATA**

Quarterly Financial Information for the Years Ended December 31, 2019 and 2018 (Unaudited)

The following consolidated financial statements are filed as part of this Annual Report on Form 10-K:

Reports of Independent Registered Public Accounting Firm.

Consolidated Statements of Earnings and Comprehensive Income for the Years Ended December 31, 2019, 2018 and 2017.

Consolidated Balance Sheets as of December 31, 2019 and 2018.

Consolidated Statements of Shareholders' Equity for the Years Ended December 31, 2019, 2018 and 2017.

Consolidated Statements of Cash Flows for the Years Ended December 31, 2019, 2018 and 2017.

Notes to Consolidated Financial Statements.

Schedule II for the Years Ended December 31, 2019, 2018 and 2017.

Armstrong World Industries, Inc., and Subsidiaries  
Quarterly Financial Information (unaudited)  
(dollar amounts in millions, except for per share data)

	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>
<u>2019</u>				
Net sales	\$ 242.1	\$ 272.0	\$ 277.1	\$ 246.9
Gross profit	91.4	103.4	111.7	88.6
Earnings from continuing operations				
Per share of common stock:				
Basic	\$ 0.75	\$ 1.30	\$ 1.86	\$ 1.06
Diluted	\$ 0.73	\$ 1.28	\$ 1.83	\$ 1.04
Price range of common stock - high	\$ 79.53	\$ 99.27	\$ 104.50	\$ 103.66
Price range of common stock - low	\$ 57.38	\$ 79.77	\$ 91.16	\$ 89.58
Cash dividend per common share	\$ 0.175	\$ 0.175	\$ 0.175	\$ 0.200
<u>2018</u>				
Net sales	\$ 227.3	\$ 248.6	\$ 260.5	\$ 238.9
Gross profit	70.8	82.7	97.9	82.1
Earnings from continuing operations				
Per share of common stock:				
Basic	\$ 0.78	\$ 0.91	\$ 1.26	\$ 0.74
Diluted	\$ 0.76	\$ 0.90	\$ 1.23	\$ 0.73
Price range of common stock - high	\$ 64.60	\$ 65.00	\$ 73.45	\$ 71.50
Price range of common stock - low	\$ 55.65	\$ 54.45	\$ 62.15	\$ 54.34
Cash dividend per common share	\$ -	\$ -	\$ -	\$ 0.175

Note: The net sales and gross profit amounts above are reported on a continuing operations basis. The sum of the quarterly earnings per share data may not equal the total year amounts due to changes in the average shares outstanding and, for diluted data, the exclusion of the anti-dilutive effect in certain quarters.

Armstrong World Industries, Inc., and Subsidiaries  
Quarterly Financial Information (unaudited)  
(dollar amounts in millions, except for per share data)

Fourth Quarter 2019 Compared With Fourth Quarter 2018 – Continuing Operations

Consolidated net sales of \$246.9 million in the fourth quarter of 2019 increased 3.3% due to favorable AUV of \$9 million, partially offset by lower volumes of \$1 million.

Mineral Fiber net sales increased 3.0% due to favorable AUV of \$9 million, partially offset by lower volumes of \$3 million. Architectural Specialties net sales increased 4.6% due to higher volumes, primarily as a result of the impact of the 2019 Acquisitions, partially offset by unfavorable project timing and extended lead times from a third party supplier.

For the fourth quarter of 2019, cost of goods sold was 64.1% of net sales, compared to 65.6% in 2018. The decrease in cost of goods sold as a percent of net sales in comparison to 2018 was driven primarily by the absence of \$2 million of costs attributable to the closure of our St. Helens, Oregon facility in addition to increased price realization in excess of inflation, partially offset by increases in cost of goods sold related to the 2019 Acquisitions.

SG&A expenses for the fourth quarter of 2019 were \$40.0 million, or 16.2% of net sales compared to \$45.3 million, or 19.0% of net sales, for the fourth quarter of 2018. The decrease in SG&A expenses was driven primarily by a \$4 million decrease in legal and professional fees, \$3 million of cost reimbursements, net of expenses, earned in 2019 under our Transition Services Agreement with Knauf and a \$3 million reduction in share-based compensation expense. These decreases in SG&A expenses were partially offset by higher expenses related to the impact of the 2019 Acquisitions.

Equity earnings in the fourth quarter of 2019 were \$13.6 million compared to \$15.7 million for the fourth quarter of 2018. During the fourth quarter of 2019 and as a result of the Sale, we recorded a \$5 million decrease in WAVE equity earnings, representing our share of WAVE's fourth quarter of 2019 loss on sale of its discontinued European and Pacific Rim businesses. Excluding the impact of our portion of WAVE's fourth quarter loss on the Sale, WAVE equity earnings increased due to higher sales volumes and lower input costs, particularly steel. See Note 11 to the Consolidated Financial Statements for further information.

Operating income was \$62.2 million in the fourth quarter of 2019 compared to \$52.5 million in the fourth quarter of 2018.

Interest expense in the fourth quarter of 2019 decreased to \$6.8 million compared to \$10.3 million in the fourth quarter of 2018 due to lower borrowings, a reduced cost of debt as a result of our September 30, 2019 refinancing and a decrease in LIBOR.

Fourth quarter income tax expense was \$8.3 million on pre-tax earnings from continuing operations of \$59.8 million in 2019 compared to income tax expense of \$10.8 million on a pre-tax earnings from continuing operations of \$47.4 million in 2018. The effective tax rate for the fourth quarter of 2019 was lower than the same period in 2018 primarily due to discrete tax benefits in the fourth quarter of 2019 related to federal stock compensation deductions and state deferred tax benefits.

## Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended. Our internal control over financial reporting was designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles.

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

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation and the criteria in the COSO framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

KPMG LLP, an independent registered public accounting firm, audited our internal control over financial reporting as of December 31, 2019, as stated in their report included herein.

/s/ Victor D. Grizzle

Victor D. Grizzle  
Director, President and Chief Executive Officer

/s/ Brian L. MacNeal

Brian L. MacNeal  
Senior Vice President and Chief Financial Officer

/s/ Stephen F. McNamara

Stephen F. McNamara  
Vice President and Corporate Controller

February 25, 2020

## Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors  
Armstrong World Industries, Inc.:

### *Opinion on Internal Control Over Financial Reporting*

We have audited Armstrong World Industries, Inc. and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of earnings and comprehensive income, shareholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes and financial statement schedule II (collectively, the consolidated financial statements), and our report dated February 25, 2020 expressed an unqualified opinion on those consolidated financial statements.

### *Basis for Opinion*

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

### *Definition and Limitations of Internal Control Over Financial Reporting*

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

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

/s/ KPMG LLP

Philadelphia, Pennsylvania  
February 25, 2020

## Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors  
Armstrong World Industries, Inc.:

### *Opinion on the Consolidated Financial Statements*

We have audited the accompanying consolidated balance sheets of Armstrong World Industries, Inc. and subsidiaries (the Company) as of December 31, 2019 and 2018, the related consolidated statements of earnings and comprehensive income, shareholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes and financial statement schedule II (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 25, 2020 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

### *Change in Accounting Principle*

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for revenue as of January 1, 2018 due to the adoption of Accounting Standards Codification Topic 606, *Revenue from Contracts with Customers*, and the related amendments.

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for leases as of January 1, 2019 due to the adoption of Accounting Standards Codification Topic 842, *Leases*, and the related amendments.

### *Basis for Opinion*

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

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

### *Critical Audit Matter*

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgment. The communication of a critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

#### *Evaluation of benefit obligations*

As discussed in Notes 2 and 18 to the consolidated financial statements, the Company's pension projected benefit obligations and the fair value of plan assets for the U.S. plans were \$1,431.4 million and \$1,478.4 million, respectively, as of December 31, 2019, resulting in a funded status of \$47.0 million. Additionally, the Company's accumulated postretirement benefit obligation was \$76.6 million, which is an unfunded liability.

We identified the evaluation of the benefit obligations to be a critical audit matter because of the specialized skills required to understand the Company's actuarial models and assumptions. In addition, the benefit obligations were sensitive to changes in key assumptions used, in particular the discount rate.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Company's benefit obligations process, including controls related to the development of the discount rates. We involved an actuarial professional with specialized skill and knowledge, who assisted in:

- understanding and assessing the actuarial models and assumptions used by the Company to estimate the benefit obligations;
- the evaluation of Company's discount rates, by assessing changes in the discount rates from the prior year against changes in published indices, assessing the discount rates based on the plan type, plan provisions and pattern of cash flows; and
- evaluating the selected yield curve, the consistency of the yield curve with the prior year, and the spot rates, to further assess the discount rates.

/s/ KPMG LLP

We have served as the Company's auditor since 1929.

Philadelphia, Pennsylvania  
February 25, 2020



Armstrong World Industries, Inc., and Subsidiaries  
Consolidated Statements of Earnings and Comprehensive Income  
(amounts in millions, except per share data)

	Years Ended December 31,		
	2019	2018	2017
Net sales	\$ 1,038.1	\$ 975.3	\$ 893.6
Cost of goods sold	643.0	641.8	578.2
Gross profit	395.1	333.5	315.4
Selling, general and administrative expenses	174.3	159.0	138.6
Equity earnings from joint venture	(96.6)	(74.9)	(67.0)
Operating income	317.4	249.4	243.8
Interest expense	38.4	39.2	35.4
Other non-operating (income), net	(20.4)	(32.5)	(13.7)
Earnings from continuing operations before income taxes	299.4	242.7	222.1
Income tax expense	57.1	53.1	1.5
Earnings from continuing operations	242.3	189.6	220.6
Net (loss) earnings from discontinued operations, net of tax expense of \$12.0, \$8.2 and \$3.6	(1.8)	9.6	4.2
(Loss) from disposal of discontinued businesses, net of tax (benefit) of (\$5.2), (\$6.0) and (\$4.1)	(26.0)	(13.3)	(105.2)
Net (loss) from discontinued operations	(27.8)	(3.7)	(101.0)
Net earnings	\$ 214.5	\$ 185.9	\$ 119.6
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	84.1	(27.6)	24.5
Derivative (loss) gain, net	(13.9)	1.1	(0.3)
Pension and postretirement adjustments	13.2	(32.9)	33.7
Total other comprehensive income (loss)	83.4	(59.4)	57.9
Total comprehensive income	\$ 297.9	\$ 126.5	\$ 177.5
Earnings per share of common stock, continuing operations:			
Basic	\$ 4.97	\$ 3.68	\$ 4.12
Diluted	\$ 4.88	\$ 3.63	\$ 4.08
(Loss) per share of common stock, discontinued operations:			
Basic	\$ (0.57)	\$ (0.07)	\$ (1.89)
Diluted	\$ (0.56)	\$ (0.07)	\$ (1.87)
Net earnings per share of common stock:			
Basic	\$ 4.40	\$ 3.61	\$ 2.23
Diluted	\$ 4.32	\$ 3.56	\$ 2.21
Average number of common shares outstanding:			
Basic	48.7	51.3	53.3
Diluted	49.5	52.1	53.9

*See accompanying notes to consolidated financial statements beginning on page 43.*

Armstrong World Industries, Inc., and Subsidiaries  
Consolidated Balance Sheets  
(amounts in millions, except share data)

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
<u>Assets</u>		
Current assets:		
Cash and cash equivalents	\$ 45.3	\$ 325.7
Accounts and notes receivable, net	85.1	79.9
Inventories, net	68.5	61.2
Assets of discontinued operations	-	244.3
Income taxes receivable	30.0	1.7
Other current assets	15.5	4.8
Total current assets	244.4	717.6
Property, plant, and equipment, less accumulated depreciation and amortization of \$447.5 and \$412.9, respectively	524.6	501.0
Lease right-of-use assets	35.3	-
Prepaid pension costs	94.8	52.8
Investment in joint venture	58.5	40.8
Goodwill	53.0	19.2
Intangible assets, net	411.9	422.8
Deferred income taxes	10.4	14.8
Income taxes receivable	2.5	0.8
Other non-current assets	57.9	68.5
Total assets	\$ 1,493.3	\$ 1,838.3
<u>Liabilities and Shareholders' Equity</u>		
Current liabilities:		
Current installments of long-term debt	\$ 6.3	\$ 55.0
Accounts payable and accrued expenses	148.7	383.3
Liabilities of discontinued operations	-	110.3
Income taxes payable	0.2	0.9
Total current liabilities	155.2	549.5
Long-term debt, less current installments	604.5	764.8
Lease non-current liabilities	30.1	-
Postretirement benefit liabilities	71.0	58.8
Pension benefit liabilities	46.6	50.3
Other long-term liabilities	37.8	38.0
Income taxes payable	19.3	26.5
Deferred income taxes	163.9	124.4
Total non-current liabilities	973.2	1,062.8
Shareholders' equity:		
Common stock, \$0.01 par value per share, 200 million shares authorized, 62,263,395 shares issued and 47,992,348 shares outstanding as of December 31, 2019 and 61,553,724, shares issued and 48,808,239 shares outstanding as of December 31, 2018	0.6	0.6
Capital in excess of par value	555.7	547.4
Retained earnings	1,008.2	829.8
Treasury stock, at cost, 14,271,047 shares as of December 31, 2019 and 12,745,485 shares as of December 31, 2018	(823.5)	(692.2)
Accumulated other comprehensive (loss)	(376.1)	(459.6)
Total shareholders' equity	364.9	226.0
Total liabilities and shareholders' equity	\$ 1,493.3	\$ 1,838.3

*See accompanying notes to consolidated financial statements beginning on page 43.*

Armstrong World Industries, Inc., and Subsidiaries  
Consolidated Statements of Shareholders' Equity  
(amounts in millions, except share data)

	Common Stock		Additional Paid-In Capital	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive (Loss)	Total
	Shares	Amount			Shares	Amount		
December 31, 2016	54,428,233	\$ 0.6	\$ 504.9	\$ 469.9	6,168,907	\$ (305.2)	\$ (403.8)	\$ 266.4
Cumulative effect impact of ASU 2016-09 adoption	-	-	-	8.7	-	-	-	8.7
Stock issuance, net	185,596	-	-	-	-	-	-	-
Share-based employee compensation	-	-	11.4	-	-	-	-	11.4
Net earnings	-	-	-	119.6	-	-	-	119.6
Other comprehensive income	-	-	-	-	-	-	57.9	57.9
Separation of Armstrong Flooring, Inc.	-	-	0.5	-	-	-	-	0.5
Acquisition of treasury stock	(1,841,690)	-	-	-	1,841,690	(80.4)	-	(80.4)
December 31, 2017	<u>52,772,139</u>	<u>\$ 0.6</u>	<u>\$ 516.8</u>	<u>\$ 598.2</u>	<u>8,010,597</u>	<u>\$ (385.6)</u>	<u>\$ (345.9)</u>	<u>\$ 384.1</u>
Cumulative effect impact of ASU 2018-02 adoption	-	-	-	54.3	-	-	(54.3)	-
Stock issuance, net	770,988	-	-	-	-	-	-	-
Cash dividends - \$0.175 per common share	-	-	-	(8.6)	-	-	-	(8.6)
Share-based employee compensation	-	-	30.6	-	-	-	-	30.6
Net earnings	-	-	-	185.9	-	-	-	185.9
Other comprehensive (loss)	-	-	-	-	-	-	(59.4)	(59.4)
Acquisition of treasury stock	(4,734,888)	-	-	-	4,734,888	(306.6)	-	(306.6)
December 31, 2018	<u>48,808,239</u>	<u>\$ 0.6</u>	<u>\$ 547.4</u>	<u>\$ 829.8</u>	<u>12,745,485</u>	<u>\$ (692.2)</u>	<u>\$ (459.6)</u>	<u>\$ 226.0</u>
Cumulative effect impact of ASU 2017-12 adoption	-	-	-	(0.1)	-	-	0.1	-
Stock issuance, net	709,671	-	-	-	-	-	-	-
Cash dividends - \$0.725 per common share	-	-	-	(36.0)	-	-	-	(36.0)
Share-based employee compensation	-	-	8.3	-	-	-	-	8.3
Net earnings	-	-	-	214.5	-	-	-	214.5
Other comprehensive income	-	-	-	-	-	-	83.4	83.4
Acquisition of treasury stock	(1,525,562)	-	-	-	1,525,562	(131.3)	-	(131.3)
December 31, 2019	<u>47,992,348</u>	<u>\$ 0.6</u>	<u>\$ 555.7</u>	<u>\$ 1,008.2</u>	<u>14,271,047</u>	<u>\$ (823.5)</u>	<u>\$ (376.1)</u>	<u>\$ 364.9</u>

*See accompanying notes to consolidated financial statements beginning on page 43.*

Armstrong World Industries, Inc., and Subsidiaries  
Consolidated Statements of Cash Flows  
(amounts in millions)

	Years Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net earnings	\$ 214.5	\$ 185.9	\$ 119.6
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Depreciation and amortization	72.1	79.4	89.2
Loss on disposal of discontinued operations	31.2	19.3	109.3
Write-off debt refinancing fees	2.7	-	-
Deferred income taxes	14.0	(3.8)	(12.3)
Share-based compensation	9.5	14.0	10.2
Equity earnings from joint venture	(96.6)	(74.9)	(67.0)
U.S. pension (credit)	(7.5)	(26.3)	(4.5)
Other non-cash adjustments, net	2.5	2.9	(0.4)
Changes in operating assets and liabilities:			
Receivables	(1.1)	13.2	(37.1)
Inventories	(7.2)	(8.9)	3.6
Other current assets	(6.9)	9.4	2.2
Other non-current assets	2.1	(5.5)	(1.6)
Accounts payable and accrued expenses	(19.9)	5.4	(20.0)
Income taxes receivables and payables, net	(8.4)	7.5	(18.8)
Other long-term liabilities	(15.6)	(14.4)	(1.2)
Other, net	(2.7)	-	(0.8)
Net cash provided by operating activities	<u>182.7</u>	<u>203.2</u>	<u>170.4</u>
Cash flows from investing activities:			
Purchases of property, plant and equipment	(71.3)	(71.9)	(89.7)
Return of investment from joint venture	85.2	141.7	69.1
Cash paid for acquisitions	(56.4)	(22.2)	(31.2)
Cash consideration received from Knauf	-	330.0	-
Payments of proceeds from Knauf to investment in joint venture	-	(70.0)	-
Payments to Knauf upon disposal of discontinued operations	(47.9)	-	-
Other investing activities	1.3	2.0	(2.4)
Net cash (used for) provided by investing activities	<u>(89.1)</u>	<u>309.6</u>	<u>(54.2)</u>
Cash flows from financing activities:			
Proceeds from revolving credit facility	185.0	-	103.0
Payments of revolving credit facility	(70.0)	-	(103.0)
Proceeds from long-term debt	500.0	-	-
Payments of long-term debt	(825.4)	(32.5)	(25.0)
Financing costs	(2.9)	-	(0.6)
Dividend paid	(35.6)	(8.6)	-
(Payments) proceeds from share-based compensation plans, net of tax	(4.7)	18.4	3.3
Payment for treasury stock acquired	(131.3)	(306.6)	(80.4)
Net cash (used for) financing activities	<u>(384.9)</u>	<u>(329.3)</u>	<u>(102.7)</u>
Effect of exchange rate changes on cash and cash equivalents	0.9	(7.4)	4.2
Net (decrease) increase in cash and cash equivalents	(290.4)	176.1	17.7
Cash and cash equivalents at beginning of year of discontinued operations	10.0	-	-
Cash and cash equivalents at beginning of year of continuing operations	<u>325.7</u>	<u>159.6</u>	<u>141.9</u>
Cash and cash equivalents at end of period	45.3	335.7	159.6
Cash and cash equivalents at end of period of discontinued operations	-	10.0	-
Cash and cash equivalents at end of period of continuing operations	<u>\$ 45.3</u>	<u>\$ 325.7</u>	<u>\$ 159.6</u>
Supplemental Cash Flow Disclosures:			
Interest paid	\$ 33.1	\$ 29.9	\$ 30.7
Income tax payments, net	58.4	51.6	32.1
Amounts in accounts payable for capital expenditures	1.9	1.9	2.6

*See accompanying notes to consolidated financial statements beginning on page 43.*

Armstrong World Industries, Inc., and Subsidiaries  
Notes to Consolidated Financial Statements  
(dollar amounts in millions, except share data)

NOTE 1. BUSINESS

Armstrong World Industries, Inc. (“AWI”) is a Pennsylvania corporation incorporated in 1891. When we refer to “AWI,” the “Company,” “we,” “our” and “us” in these notes, we are referring to AWI and its subsidiaries.

Acquisitions

In November 2019, we acquired the business and assets of MRK Industries, Inc. (“MRK”), based in Libertyville, Illinois. MRK is a manufacturer of specialty metal ceiling, wall and exterior solutions with one manufacturing facility. MRK’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In March 2019, we acquired the business and assets of Architectural Components Group, Inc. (“ACGI”), based in Marshfield, Missouri. ACGI is a manufacturer of custom wood ceilings and walls with one manufacturing facility. ACGI’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In August 2018, we acquired the business and assets of Steel Ceilings, Inc. (“Steel Ceilings”), based in Johnstown, Ohio. Steel Ceilings is a manufacturer of aluminum and stainless metal ceilings that include architectural, radiant and security solutions with one manufacturing facility. Steel Ceilings’ operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In May 2018, we acquired the business and assets of Plasterform, Inc. (“Plasterform”), based in Mississauga, Ontario, Canada. Plasterform is a manufacturer of architectural cast ceilings, walls, facades, columns and moldings with one manufacturing facility. Plasterform’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

In January 2017, we acquired the business and assets of Tectum, Inc. (“Tectum”), based in Newark, Ohio. Tectum is a manufacturer of acoustical ceiling, wall and structural solutions for commercial building applications with two manufacturing facilities. Tectum’s operations, and its assets and liabilities, are included as a component of our Architectural Specialties segment.

See Note 5 for further information on our recent acquisitions.

Discontinued Operations

On September 30, 2019, we completed the previously announced sale of certain subsidiaries comprising our businesses and operations in Europe, the Middle East and Africa (including Russia) (“EMEA”) and the Pacific Rim, including the corresponding businesses and operations conducted by Worthington Armstrong Venture (“WAVE”), our joint venture with Worthington Industries, Inc. (“Worthington”) in which AWI holds a 50% interest (collectively, the “Sale”), to Knauf International GmbH (“Knauf”). The purchase price of \$330.0 million was previously paid by Knauf to us during the third quarter of 2018 and is subject to certain post-closing adjustments for cash and debt as provided in the Share Purchase Agreement dated as of November 17, 2017, by and between us and Knauf (the “Purchase Agreement”), including adjustments based on the economic impact of any required regulatory remedies and a working capital adjustment.

On July 18, 2018, we entered into an amendment to the Purchase Agreement, pursuant to which Knauf irrevocably and unconditionally paid AWI (i) \$250.0 million of the purchase price on August 1, 2018, and (ii) \$80.0 million of the purchase price on September 15, 2018, which payments were credited against the aggregate consideration payable at closing. The amendment also provided for the reduction (from a maximum of \$35.0 million to a maximum of \$20.0 million) of potential adjustments to the purchase price consideration for the transaction based on the impact of remedies required to satisfy competition conditions. Following receipt of these payments, we remitted \$70.0 million to WAVE in partial consideration of the purchase price payable in respect of the businesses and operations of WAVE under the transaction. WAVE subsequently paid each of AWI and Worthington a dividend of \$35.0 million. We have recorded a \$25.9 million payable to WAVE for their remaining portion of the proceeds from Knauf, which is reflected within Accounts payable and accrued expenses in the Consolidated Balance Sheets as of December 31, 2019. The transaction and final gain or loss amounts are subject to finalization of customary working capital and other adjustments, as provided in the Purchase Agreement. For the year ended December 31, 2019, payments to Knauf included \$61.0 million of adjustments to cash consideration, estimated working capital adjustments and remedies, offset by \$13.1 million of additional cash in international WAVE entities.

On December 7, 2018, the European Commission granted conditional clearance of the transaction, subject to certain commitments intended to address concerns regarding the overlap between the activities of AWI and Knauf, including the divestment by Knauf to a

Armstrong World Industries, Inc., and Subsidiaries  
Notes to Consolidated Financial Statements  
(dollar amounts in millions, except share data)

third party of certain mineral fiber and grid businesses and operations in Austria, Estonia, Germany, Ireland, Italy, Latvia, Lithuania, Portugal, Spain, Turkey and the United Kingdom (“UK”). This included our sales operations in each of the relevant countries, as well as our production facilities, and those of WAVE, located in Team Valley, UK.

On May 23, 2019, we entered into a Transition Services Agreement with Knauf for its benefit and the benefit of the buyer of the divestment business, pursuant to which we are providing certain transition technology, finance and information technology support services during the period between March 18, 2019 and September 30, 2020.

On September 23, 2019, the European Commission approved the Sale, as well as the terms of the sale of the divestment business by Knauf and the identity of the purchaser.

In connection with the closing of the Sale, we also entered into (i) an intellectual property License Agreement with Knauf for its benefit (and, under sublicense, to the buyer of the divestment business) under which they license certain patents, trademarks and know-how from us for use in certain licensed territories, and (ii) a Supply Agreement with Knauf under which the parties may continue to purchase certain products from each other following the closing of the Sale. WAVE also entered into similar agreements with Knauf for such purposes.

The EMEA and Pacific Rim segment historical financial results through September 30, 2019 have been reflected in AWI’s Consolidated Statements of Earnings and Comprehensive Income as discontinued operations for all periods presented, while the assets and liabilities of discontinued operations have been removed from AWI’s Consolidated Balance Sheet as of December 31, 2019.

**NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

**Consolidation Policy.** The consolidated financial statements and accompanying data in this report include the accounts of AWI and its majority-owned subsidiaries. All significant intercompany transactions have been eliminated from the consolidated financial statements.

**Use of Estimates.** We prepare our financial statements in conformity with U.S. Generally Accepted Accounting Principles (“U.S. GAAP”), which requires management to make estimates and assumptions. These estimates and assumptions affect the reported amounts of assets, liabilities, revenues and expenses. When preparing an estimate, management determines the amount based upon the consideration of relevant internal and external information. Actual results may differ from these estimates.

**Reclassifications.** Certain amounts in the prior year’s Consolidated Financial Statements and related notes have been recast to conform to the 2019 presentation.

**Revision of Previously Issued Financial Statements.** During the second quarter of 2019, we revised the Consolidated Financial Statements and related notes included herein to correct an immaterial error related to the previously reported estimated loss on sale of our EMEA and Pacific Rim businesses. The immaterial correction increased the estimated loss on sale and reduced the assets held for sale by \$35.2 million as of December 31, 2017. Notes 1, 6 and 15 have been updated to reflect the restatement. The impacts of this error correction are as follows:

*Statements of Earnings and Comprehensive Income*

	Year Ended	
	December 31, 2017	
	As Reported	As Adjusted
Loss on disposal of discontinued businesses, net of tax (benefit) of (\$4.1)	\$ (70.0)	\$ (105.2)
Net loss from operations	(65.8)	(101.0)
Net earnings	154.8	119.6
Total comprehensive income	212.7	177.5
(Loss) per share of common stock, discontinued operations:		
Basic	\$ (1.23)	\$ (1.89)
Diluted	\$ (1.22)	\$ (1.87)
Net earnings per share of common stock:		
Basic	\$ 2.89	\$ 2.23
Diluted	\$ 2.86	\$ 2.21

Armstrong World Industries, Inc., and Subsidiaries  
Notes to Consolidated Financial Statements  
(dollar amounts in millions, except share data)

Balance Sheets

	December 31, 2018	
	As Reported	As Adjusted
	Current assets of discontinued operations	\$ 279.5
Total current assets	752.8	717.6
Total assets	1,873.5	1,838.3
Retained earnings	865.0	829.8
Total shareholders' equity	261.2	226.0
Total liabilities and shareholders' equity	1,873.5	1,838.3

Statements of Shareholders' Equity

	Retained Earnings		Total Shareholders' Equity	
	As Reported	As Adjusted	As Reported	As Adjusted
	December 31, 2017	\$ 633.4	\$ 598.2	\$ 419.3
December 31, 2018	865.0	829.8	261.2	226.0

Statements of Cash Flows

	Year Ended December 31, 2017	
	As Reported	As Adjusted
	Net earnings	\$ 154.8
Loss on disposal of discontinued operations	74.1	109.3

Discontinued Operations

	Year Ended December 31, 2017	
	As Reported	As Adjusted
	<u>EMEA and Pacific Rim Businesses</u>	
(Loss) from disposal of discontinued businesses, before income tax	\$ (74.0)	\$ (109.2)
(Loss) gain from disposal of discontinued businesses, net of tax	(74.0)	(109.2)
Net (loss) earnings from discontinued operations	(69.8)	(105.0)
<u>Total</u>		
(Loss) from disposal of discontinued businesses, before income tax	\$ (74.1)	\$ (109.3)
(Loss) gain from disposal of discontinued businesses, net of tax	(70.0)	(105.2)
Net (loss) earnings from discontinued operations	(65.8)	(101.0)

	December 31, 2018	
	As Reported	As Adjusted
	Property, plant, and equipment, less accumulated depreciation and amortization	\$ 103.8
Total non-current assets of discontinued operations	143.5	108.3
Total assets of discontinued operations	279.5	244.3

	Year Ended December 31, 2017	
	As Reported	As Adjusted
	Estimated loss on sale to Knauf	74.0

Armstrong World Industries, Inc., and Subsidiaries  
Notes to Consolidated Financial Statements  
(dollar amounts in millions, except share data)

Accounts Payable and Accrued Expenses

	December 31, 2018	
	As Reported	As Adjusted
Advance receipt of Knauf proceeds	\$ 237.6	\$ 202.4
Contingent liability payable to Knauf for adjustments to cash consideration	-	35.2

Revenue Recognition. On January 1, 2018, we adopted Accounting Standards Codification (“ASC”) 606 - Revenue from Contracts with Customers and all the related amendments using the modified retrospective transition method. This adoption did not have a material impact on our financial condition, results of operations or cash flows as the amount and timing of substantially all of our revenues are recognized at a point in time.

We recognize revenue upon transfer of control of our products to the customer, which typically occurs upon shipment. Our main performance obligation to our customers is the delivery of products in accordance with purchase orders. Each purchase order confirms the transaction price for the products purchased under the arrangement. Direct sales to building materials distributors, home centers, direct customers and retailers represent the majority of our sales. Our standard sales terms are Free On Board (“FOB”) shipping point. We have some sales terms that are FOB destination. At the point of shipment, the customer is required to pay under normal sales terms. Our normal payment terms in most cases are 45 days or less and our sales arrangements do not have any material financing components. In addition, our customer arrangements do not produce contract assets or liabilities that are material to our consolidated financial statements. Within our Architectural Specialties segment, the majority of revenues are customer project driven, which includes a minority of revenues derived from the sale of customer specified customized products that have no alternative use to us. The manufacturing cycle for these custom products is typically short.

Incremental costs to fulfill our customer arrangements are expensed as incurred, as the amortization period is less than one year.

Our products are sold with normal and customary return provisions. We provide limited warranties for defects in materials or factory workmanship, sagging and warping, and certain other manufacturing defects. Warranties are not sold separately to customers. Our product warranties place certain requirements on the purchaser, including installation and maintenance in accordance with our written instructions. In addition to our warranty program, under certain limited circumstances, we will occasionally at our sole discretion provide a customer accommodation repair or replacement. Warranty repairs and replacements are most commonly made by professional installers employed by or affiliated with our independent distributors. Reimbursement for costs associated with warranty repairs are provided to our independent distributors through a credit against accounts receivable from the distributor to us. Sales returns and warranty claims have historically not been material and do not constitute separate performance obligations.

We often offer incentive programs to our customers, primarily volume rebates and promotions. The majority of our rebates are designated as a percentage of annual customer purchases. We estimate the amount of rebates based on actual sales for the period and accrue for the projected incentive programs costs. We record the costs of rebate accruals as a reduction to the transaction price. Other sales discounts, including early pay promotions, are deducted immediately from the sales invoice.

See Note 4 to the Consolidated Financial Statements for additional information related to our revenues.

Shipping and Handling Costs. We account for product shipping and handling costs as fulfillment activities and present the associated costs in costs of goods sold in the period in which we sell our product.

Advertising Costs. We recognize advertising expenses as they are incurred.

Research and Development Costs. We expense research and development costs as they are incurred.

Pension and Postretirement Benefits. We have benefit plans that provide for pension, medical and life insurance benefits to certain eligible employees when they retire from active service. See Note 18 to the Consolidated Financial Statements for disclosures on pension and postretirement benefits.

Taxes. The provision for income taxes has been determined using the asset and liability approach of accounting for income taxes to reflect the expected future tax consequences of events recognized in the financial statements. Deferred income tax assets and liabilities are recognized by applying enacted tax rates to temporary differences that exist as of the balance sheet date, which result from differences in the timing of reported taxable income between tax and financial reporting.



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We reduce the carrying amounts of deferred tax assets by a valuation allowance if, based on the available evidence, it is more likely than not that such assets will not be realized. The need to establish valuation allowances for deferred tax assets is assessed quarterly. In assessing the requirement for, and amount of, a valuation allowance in accordance with the more likely than not standard, we give appropriate consideration to all positive and negative evidence related to the realization of the deferred tax assets. This assessment considers, among other matters, the nature, frequency and severity of current and cumulative losses, forecasts of future profitability and foreign source income, the duration of statutory carryforward periods, and our experience with operating loss and tax credit carryforward expirations. A history of cumulative losses is a significant piece of negative evidence used in our assessment. If a history of cumulative losses is incurred for a tax jurisdiction, forecasts of future profitability are generally not used as positive evidence related to the realization of the deferred tax assets in the assessment.

We recognize the tax benefits of an uncertain tax position if those benefits are more likely than not to be sustained based on existing tax law. Additionally, we establish a reserve for tax positions that are more likely than not to be sustained based on existing tax law, but uncertain in the ultimate benefit to be sustained upon examination by the relevant taxing authorities. Unrecognized tax benefits are subsequently recognized at the time the more likely than not recognition threshold is met, the tax matter is effectively settled or the statute of limitations for the relevant taxing authority to examine and challenge the tax position has expired, whichever is earlier.

Taxes collected from customers and remitted to governmental authorities are reported on a net basis.

Earnings per Share. Basic earnings per share is computed by dividing the earnings attributable to common shares by the weighted average number of shares of common stock outstanding during the period. Diluted earnings per share reflects the potential dilution of securities that could share in the earnings.

Cash and Cash Equivalents. Cash and cash equivalents include cash on hand, short-term investments that have maturities of three months or less when purchased and restricted cash.

Concentration of Credit. We principally sell products to customers in building products industries in various geographic regions. Revenues from two commercial distributors, included within our Mineral Fiber and Architectural Specialties segments, individually exceeded 10% of our revenues in 2019. Gross sales to these two customers totaled \$428.7 million in 2019. Revenues from three commercial distributors individually exceeded 10% of our revenues in 2018 and 2017. Gross sales to these three customers totaled \$459.3 million and \$426.1 million in 2018 and 2017, respectively. We monitor the creditworthiness of our customers and generally do not require collateral.

Receivables. We sell our products to select, pre-approved customers using customary trade terms that allow for payment in the future. Customer trade receivables, customer notes receivable and miscellaneous receivables (which include supply related rebates and other), net of allowances for doubtful accounts, customer credits and warranties are reported in accounts and notes receivable, net. Cash flows from the collection of receivables are classified as operating cash flows on the consolidated statements of cash flows.

We establish credit-worthiness prior to extending credit. We estimate the recoverability of receivables each period. This estimate is based upon new information in the period, which can include the review of any available financial statements and forecasts, as well as discussions with legal counsel and the management of the debtor company. As events occur, which impact the collectability of the receivable, all or a portion of the receivable is reserved. Account balances are charged off against the allowance when the potential for recovery is considered remote. We do not have any off-balance sheet credit exposure related to our customers.

Inventories. Inventories are valued at the lower of cost and net realizable value. See Note 8 to the Consolidated Financial Statements for further information on our accounting for inventories.

Property Plant and Equipment. Property plant and equipment is recorded at cost reduced by accumulated depreciation. Depreciation expense is recognized on a straight-line basis over the assets' estimated useful lives. Machinery and equipment includes manufacturing equipment (depreciated over 3 to 15 years), computer equipment (depreciated over 3 to 5 years) and office furniture and equipment (depreciated over 5 to 7 years). Within manufacturing equipment, assets that are subject to accelerated obsolescence or wear out quickly, such as dryer components, are depreciated over shorter periods (3 to 7 years). Heavy production equipment, such as conveyors and production presses, are depreciated over longer periods (13 to 15 years). Buildings are depreciated over 15 to 30 years, depending on factors such as type of construction and use. Computer software is depreciated over 3 to 7 years.

Property, plant and equipment is tested for impairment by asset group when indicators of impairment are present, such as operating losses and/or negative cash flows. If an indication of impairment exists, we compare the carrying amount of the asset group to the

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estimated undiscounted future cash flows expected to be generated by the asset group. The estimate of an asset group's fair value is based on discounted future cash flows expected to be generated by the asset group, or based on management's estimated exit price assuming the assets could be sold in an orderly transaction between market participants, or estimated salvage value if no sale is assumed. If the fair value is less than the carrying value of the asset group, we record an impairment charge equal to the difference between the fair value and carrying value of the asset group. Impairments of assets related to our manufacturing operations are recorded in cost of goods sold.

When assets are disposed of or retired, their costs and related depreciation are removed from the financial statements, and any resulting gains or losses normally are reflected in cost of goods sold or selling, general and administrative ("SG&A") expenses depending on the nature of the asset.

Asset Retirement Obligations. We recognize the fair value of obligations associated with the retirement of tangible long-lived assets in the period in which they are incurred. Upon initial recognition of a liability, the discounted cost is capitalized as part of the related long-lived asset and depreciated over the corresponding asset's useful life. Over time, accretion of the liability is recognized as an operating expense to reflect the change in the liability's present value.

Goodwill and Intangible Assets. Our definite-lived intangible assets are primarily customer relationships (amortized over 3 to 20 years) and developed technology (amortized over 15 years). We review significant definite-lived intangible assets for impairment when indicators of impairment exist. We review our businesses for indicators of impairment such as operating losses and/or negative cash flows. If an indication of impairment exists, we compare the carrying amount of the asset group to the estimated undiscounted future cash flows expected to be generated by the asset group. If the carrying value exceeds the undiscounted future cash flows, the fair value of the asset group is determined. The estimate of an asset group's fair value is based on discounted future cash flows expected to be generated by the asset group, or based on management's estimated exit price assuming the assets could be sold in an orderly transaction between market participants. If the fair value is less than the carrying value of the asset group, we record an impairment charge equal to the difference between the fair value and carrying value of the asset group.

Our indefinite-lived assets include goodwill and other intangibles, primarily trademarks and brand names, with Armstrong representing our primary trademark. Trademarks and brand names are integral to our corporate identity and are expected to contribute indefinitely to our cash flows. Accordingly, they have been assigned an indefinite life. We conduct our annual impairment tests on these indefinite-lived intangible assets and goodwill during the fourth quarter. These assets undergo more frequent tests if an indication of possible impairment exists. When performing an impairment test for indefinite-lived intangible assets and goodwill, we compare the carrying amount of the asset (when testing indefinite-lived intangible assets) and reporting unit (when testing goodwill) to the estimated fair value. For indefinite-lived intangible assets, the estimated fair value is based on discounted future cash flows using the relief from royalty method. For goodwill, the estimated fair value is based on discounted future cash flows expected to be generated by the reporting unit. If the fair value is less than the carrying value of the asset/reporting unit, we record an impairment charge equal to the difference between the fair value and carrying value of the asset/reporting unit.

The principal assumptions used in our impairment tests for definite-lived intangible assets is operating profit adjusted for depreciation and amortization and, if required to estimate the fair value, the discount rate. The principal assumptions used in our impairment tests for indefinite-lived intangible assets include revenue growth rate, discount rate and royalty rate. The principal assumptions utilized in our impairment tests for goodwill include after-tax cash flows growth rates and discount rate. Revenue growth rates, after-tax cash flows growth rates and operating profit assumptions are derived from those used in our operating plan and strategic planning processes. The discount rate assumption is calculated based upon an estimated weighted average cost of capital which reflects the overall level of inherent risk and the rate of return a market participant would expect to achieve. The royalty rate assumption represents the estimated contribution of the intangible assets to the overall profits of the related businesses. Methodologies used for valuing our intangible assets did not change from prior periods.

See Note 13 to the Consolidated Financial Statements for disclosure on intangible assets.

Foreign Currency Transactions. Assets and liabilities of our subsidiaries operating outside the United States which are accounted in a functional currency other than U.S. dollars are translated using the period end exchange rate. Revenues and expenses are translated at exchange rates effective during each month. Foreign currency translation gains or losses are included as a component of accumulated other comprehensive (loss) within shareholders' equity. Gains or losses on foreign currency transactions are recognized through earnings.

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Financial Instruments and Derivatives. From time to time, we use derivatives and other financial instruments to offset the effect of interest rate variability. See Notes 19 and 20 to the Consolidated Financial Statements for further discussion.

Share-based Employee Compensation. We generally recognize share-based compensation expense on a straight-line basis over the vesting period for the entire award. Compensation expense for performance-based awards with non-market-based conditions are also recognized over the vesting period for the entire award, however, compensation expense may vary based on the expectations for actual performance relative to defined performance measures. We estimate forfeitures based on actual historical forfeitures. See Note 22 to the Consolidated Financial Statements for additional information on share-based employee compensation.

Subsequent Events. On February 19, 2020, our Board of Directors declared a dividend of \$0.20 per common share outstanding. The dividend will be paid on March 20, 2020, to shareholders of record as of the close of business on March 5, 2020.

On February 20, 2020, we entered into a commitment agreement with a third-party insurance company to partially settle approximately \$1.0 billion of retiree benefit obligations under our Retirement Income Plan (“RIP”). See Note 18 to the Consolidated Financial Statements for further information.

#### Recently Adopted Accounting Standards

In February 2016, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) 2016-02, “Leases,” which amends accounting for leases, most notably by requiring a lessee to recognize the assets and liabilities that arise from a lease agreement. Specifically, this new guidance requires lessees to recognize a liability to make lease payments and a right-of-use (“ROU”) asset representing its right to use the underlying asset for the lease term, with limited exceptions.

In January 2018, the FASB issued ASU 2018-01, “Land Easement Practical Expedient for Transition to Topic 842,” which permits an entity to elect an optional transition practical expedient to not evaluate under Topic 842 land easements that exist at transition or expired before the adoption of Topic 842 and that were not previously accounted for as leases under Topic 840. In July 2018, the FASB issued ASU 2018-10, “Codification Improvements to Topic 842, Leases,” which affects narrow aspects of the guidance issued in the amendments in Update 2016-02. In July 2018, the FASB also issued ASU 2018-11, “Targeted Improvements,” which allows companies to adopt ASC Topic 842 without revising comparative period reporting or disclosures and provides an optional practical expedient for lessors to not separate lease and non-lease components of a contract when certain criteria are met.

Effective January 1, 2019, we adopted these standards using the modified retrospective transition method and have applied all practical expedients related to leases existing at the date of initial application. Upon adoption, the most significant change was to the Consolidated Balance Sheet related to the recognition of new ROU assets and lease liabilities on a continuing operations basis. Upon adoption we recognized ROU assets and lease liabilities of \$29.2 million, based on the present value of the future minimum rental payments for existing operating leases. We have no leases that classify as financing arrangements. As required by the lease ASC updates, we expanded our disclosure of leases. See Note 12 for additional information.

In August 2017, the FASB issued ASU 2017-12, “Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities,” which amends the financial reporting of hedging relationships in order to better portray the economic results of an entity’s risk management activities in its financial statements. In addition, the guidance simplifies the application of current hedge accounting guidance. Effective January 1, 2019, we adopted the guidance, which had no material impact on our financial condition, results of operations or cash flows.

In June 2018, the FASB issued ASU 2018-07, “Improvements to Nonemployee Share-Based Payment Accounting,” which simplifies the aspects of accounting for nonemployee share-based payment transactions resulting from expanding the scope of ASC Topic 718 – Compensation – Stock Compensation, to include share-based payment transactions for acquiring goods and services from non-employees. Effective January 1, 2019, we adopted this standard using the modified retrospective transition method. Our adoption of this standard had no material impact on our financial condition, results of operations or cash flows.

#### Recently Issued Accounting Standards

In June 2016, the FASB issued ASU 2016-13, “Measurement of Credit Losses on Financial Instruments,” which requires immediate recognition of estimated credit losses that are expected to occur over the remaining life of many financial assets. This standard applies to all financial assets, including trade receivables. Our current accounts receivable policy uses historical and current information to

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estimate the amount of probable credit losses in our existing accounts receivable balances. This new guidance is effective for annual and interim periods in fiscal years beginning after December 15, 2019. The adoption of this standard will not have a material impact on our financial condition, results of operations or cash flows.

In January 2017, the FASB issued ASU 2017-04, *“Intangibles – Goodwill and Other,”* which simplifies the subsequent measurement of goodwill by eliminating the second step from the current goodwill impairment test. Under this standard, an entity would recognize an impairment charge for the amount by which the carrying value of the reporting unit goodwill exceeds the fair value. This new guidance is effective for annual and interim periods in fiscal years beginning after December 15, 2019. The adoption of this standard will not have a material impact on our financial condition or results of operations.

In August 2018, the FASB issued ASU 2018-13, *“Changes to the Disclosure Requirements for Fair Value Measurement.”* This standard eliminates the current requirement to disclose the amount or reason for transfers between level 1 and level 2 of the fair value hierarchy and the requirement to disclose the valuation methodology for level 3 fair value measurements. The standard includes additional disclosure requirements for level 3 fair value measurements, including the requirement to disclose the changes in unrealized gains and losses in other comprehensive income during the period and permits the disclosure of other relevant quantitative information for certain unobservable inputs. This new guidance is effective for annual and interim periods beginning after December 15, 2019. The adoption of this standard will not have a material impact on our disclosures.

In August 2018, the FASB issued ASU 2018-14, *“Disclosure Framework – Changes to the Disclosure Requirements for Defined Benefit Plans,”* which amends ASC 715-20, Compensation – Retirement Benefits – Defined Benefit Plans. The ASU modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. The disclosure requirements to be removed include the amounts in accumulated other comprehensive income expected to be recognized in net periodic benefit costs over the next fiscal year, the amount and timing of plan assets expected to be returned to the employer and the effect of a one percentage point change in assumed health care cost trend rates on the aggregate service cost and benefit obligation for postretirement health care benefits. The new disclosure requirements include the interest crediting rates for cash balance plans, and an explanation of significant gains and losses related to changes in benefit obligations. This guidance is effective for fiscal years ending after December 15, 2020. We are evaluating the impact the adoption of this standard will have on our disclosures.

In August 2018, the FASB issued ASU 2018-15, *“Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That is a Service Contract,”* which amends ASC 350-40 Intangibles – Goodwill and Other – Internal-Use Software. The ASU requires implementation costs incurred by customers in cloud computing arrangements to be deferred and recognized over the term of the arrangement, if these costs were capitalized by the customer in a software licensing arrangement. This guidance is effective for fiscal years beginning after December 15, 2019. The adoption of this standard will not have a material impact on our financial condition, results of operations or cash flows.

In December 2019, the FASB issued ASU 2019-12, *“Simplifying the Accounting for Income Taxes,”* which removes exceptions to the general principles in ASC Topic 740 – Income Taxes for allocating tax expense between financial statement components, accounting basis differences resulting from an ownership change in foreign investments and interim period income tax accounting for year-to-date losses that exceed projected losses. This guidance is effective for fiscal years beginning after December 15, 2020. We are evaluating the impact the adoption of this standard will have on our financial condition and results of operations.

### NOTE 3. NATURE OF OPERATIONS

Our operating segments are as follows: Mineral Fiber, Architectural Specialties and Unallocated Corporate.

*Mineral Fiber* – produces suspended mineral fiber and soft fiber ceiling systems for use in commercial and residential settings. Products offer various performance attributes such as acoustical control, rated fire protection and aesthetic appeal. Commercial ceiling products are sold to resale distributors and to ceiling systems contractors. Residential ceiling products are sold primarily to wholesalers and retailers (including large home centers). The Mineral Fiber segment also includes the results of WAVE, which manufactures and sells suspension system (grid) products and ceiling component products that are invoiced by both AWI and WAVE. Segment results relating to WAVE consist primarily of equity earnings and reflect our 50% equity interest in the joint venture. Ceiling component products consist of ceiling perimeters and trim, in addition to grid products that support drywall ceiling systems. To a lesser extent, however, in some geographies and for some customers, WAVE sells its suspension systems products to AWI for resale to customers. Mineral Fiber segment results reflect those sales transactions. The Mineral Fiber segment also includes all assets and liabilities not specifically allocated to our Architectural Specialties or Unallocated Corporate segment, including all property and related depreciation associated with our Lancaster, PA headquarters. Operating results for the Mineral Fiber segment include a

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significant majority of allocated Corporate administrative expenses that represent a reasonable allocation of general services to support its operations.

*Architectural Specialties* – produces and sources ceilings and walls for use in commercial settings. Products are available in numerous materials, such as metal and wood, in addition to various colors, shapes and designs. Products offer various performance attributes such as acoustical control, rated fire protection and aesthetic appeal. We sell standard and customized products, with the majority of Architectural Specialties revenues derived from sourced products. Architectural Specialties products are sold primarily to resale distributors and ceiling systems contractors. The majority of revenues are project driven, which can lead to more volatile sales patterns due to project scheduling uncertainty. Operating results for the Architectural Specialties segment include a minor portion of allocated Corporate administrative expenses that represent a reasonable allocation of general services to support its operations.

*Unallocated Corporate* – includes assets, liabilities, income and expenses that have not been allocated to our other business segments and consist of: cash and cash equivalents, the net funded status of our U.S. Retirement Income Plan (“RIP”), the estimated fair value of interest rate swap contracts, outstanding borrowings under our senior credit facility and income tax balances. Our Unallocated Corporate segment also includes all assets, liabilities, income and expenses formerly reported in our EMEA and Pacific Rim segments that were not included in the Sale.

<u>For the year ended 2019</u>	<u>Mineral Fiber</u>	<u>Architectural Specialties</u>	<u>Unallocated Corporate</u>	<u>Total</u>
Net sales to external customers	\$ 826.6	\$ 211.5	\$ -	\$ 1,038.1
Equity (earnings) from joint venture	(96.6)	-	-	(96.6)
Segment operating income (loss)	289.6	35.9	(8.1)	317.4
Segment assets	1,139.9	161.8	191.6	1,493.3
Depreciation and amortization	62.9	8.8	0.4	72.1
Investment in joint venture	58.5	-	-	58.5
Purchases of property, plant and equipment <sup>(1)</sup>	59.5	8.8	-	68.3

<u>For the year ended 2018</u>	<u>Mineral Fiber</u>	<u>Architectural Specialties</u>	<u>Unallocated Corporate</u>	<u>Total</u>
Net sales to external customers	\$ 801.6	\$ 173.7	\$ -	\$ 975.3
Equity (earnings) from joint venture	(74.9)	-	-	(74.9)
Segment operating income (loss)	223.8	34.3	(8.7)	249.4
Segment assets	1,096.1	84.7	413.2	1,594.0
Depreciation and amortization	75.3	3.5	0.6	79.4
Investment in joint venture	40.8	-	-	40.8
Purchases of property, plant and equipment <sup>(1)</sup>	60.5	4.1	-	64.6

<u>For the year ended 2017</u>	<u>Mineral Fiber</u>	<u>Architectural Specialties</u>	<u>Unallocated Corporate</u>	<u>Total</u>
Net sales to external customers	\$ 756.4	\$ 137.2	\$ -	\$ 893.6
Equity (earnings) from joint venture	(67.0)	-	-	(67.0)
Segment operating income (loss)	233.5	27.7	(17.4)	243.8
Segment assets	1,193.5	53.2	320.7	1,567.4
Depreciation and amortization <sup>(1)</sup>	59.2	1.8	6.0	67.0
Investment in joint venture	107.3	-	-	107.3
Purchases of property, plant and equipment <sup>(1)</sup>	76.1	1.6	-	77.7

<sup>(1)</sup> Totals will differ from the totals on our Consolidated Statement of Cash Flows by the amounts that have been classified as discontinued operations. See Note 6 for additional details.

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Segment operating income (loss) is the measure of segment profit or loss reviewed by the chief operating decision maker. The sum of the segments' operating income (loss) equals the total consolidated operating income as reported on our Consolidated Statements of Earnings and Comprehensive Income. The following reconciles our total consolidated operating income to earnings from continuing operations before income taxes. These items are only measured and managed on a consolidated basis:

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Total consolidated operating income	\$ 317.4	\$ 249.4	\$ 243.8
Interest expense	38.4	39.2	35.4
Other non-operating (income), net	(20.4)	(32.5)	(13.7)
Earnings from continuing operations before income taxes	<u>\$ 299.4</u>	<u>\$ 242.7</u>	<u>\$ 222.1</u>

Accounting policies of the segments are the same as those described in the summary of significant accounting policies.

The sales in the table below are allocated to geographic areas based on the location of our selling entities.

<u>Geographic Areas</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
<u>Net trade sales</u>			
Mineral Fiber:			
United States and Latin America	\$ 769.0	\$ 739.2	\$ 699.8
Canada	57.6	62.4	56.6
Total Mineral Fiber	<u>826.6</u>	<u>801.6</u>	<u>756.4</u>
Architectural Specialties:			
United States and Latin America	192.3	157.5	129.5
Canada	19.2	16.2	7.7
Total Architectural Specialties	<u>211.5</u>	<u>173.7</u>	<u>137.2</u>
Total net trade sales	<u>\$ 1,038.1</u>	<u>\$ 975.3</u>	<u>\$ 893.6</u>

	<u>2019</u>	<u>2018</u>
<u>Property, plant and equipment, net at December 31,</u>		
Mineral Fiber:		
United States	\$ 496.6	\$ 487.5
Total Mineral Fiber	<u>496.6</u>	<u>487.5</u>
Architectural Specialties:		
United States	\$ 22.2	\$ 5.9
Canada	5.8	4.5
Total Architectural Specialties	<u>28.0</u>	<u>10.4</u>
Unallocated Corporate <sup>(1)</sup>	-	3.1
Total property, plant and equipment, net	<u>\$ 524.6</u>	<u>\$ 501.0</u>

<sup>(1)</sup> Includes property, plant and equipment located in China that were formerly reported in our Pacific Rim segment that were not included in the Sale. As of December 31, 2019, the property, plant and equipment located in China are classified as an asset held for sale, as we entered into a sale agreement during the third quarter of 2019 with closing expected in the second quarter of 2020.

Impairment testing of our tangible assets occurs whenever events or changes in circumstances indicate that the carrying amount of the asset group may not be recoverable.

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In connection with the 2018 closing of our St. Helens, Oregon Mineral Fiber manufacturing facility we recorded \$14.1 million in 2018 in cost of goods sold related to accelerated depreciation of property, plant and equipment. In 2017, we recorded \$4.0 million in cost of goods sold related to accelerated depreciation of property, plant and equipment within our Mineral Fiber segment.

In September 2017, we made the decision to permanently close a previously idled plant in China. As a result, during 2017 we recorded \$5.6 million in cost of goods sold for accelerated depreciation of machinery and equipment.

**NOTE 4. REVENUE**

Disaggregation of Revenues

Our Mineral Fiber and Architectural Specialties operating segments both manufacture and sell ceiling and wall systems (primarily mineral fiber, fiberglass wool, metal, wood, wood fiber, glass-reinforced-gypsum and felt) throughout the Americas. We disaggregate revenue based on our product-based segments and major customer channels, as they represent the most appropriate depiction of how the nature, amount and timing of revenues and cash flows are affected by economic factors. Net sales by major customer channel are as follows:

*Distributors* – represents net sales to building materials distributors who re-sell our products to contractors, subcontractors’ alliances, large architect and design firms, and major facility owners. Geographically, this category includes sales throughout the U.S., Canada, and Latin America.

*Home centers* – represents net sales to home centers, such as Lowe’s Companies, Inc. and The Home Depot, Inc. This category includes sales primarily to U.S. customers.

*Direct customers* – represents net sales to contractors, subcontractors, and large architect and design firms. This category includes sales primarily to U.S. customers.

*Retailers and other* – represents net sales to independent retailers and certain national account customers, including wholesalers who re-sell our products to dealers who service builders, contractors and consumers, online customers, major facility owners, group purchasing organizations and maintenance, repair and operating (MRO) entities. Geographically, this category includes sales throughout the U.S. and Canada.

The following tables provide net sales by major customer group within the Mineral Fiber and Architectural Specialties segments for the years ended December 31, 2019, 2018 and 2017:

<u>Mineral Fiber</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Distributors	\$ 622.9	\$ 601.4	\$ 563.3
Home centers	85.2	84.0	82.2
Direct customers	61.2	60.3	62.1
Retailers and other	57.3	55.9	48.8
Total	<u>\$ 826.6</u>	<u>\$ 801.6</u>	<u>\$ 756.4</u>

<u>Architectural Specialties</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Distributors	\$ 138.3	\$ 129.8	\$ 111.5
Direct customers	68.0	36.7	22.3
Retailers and other	5.2	7.2	3.4
Total	<u>\$ 211.5</u>	<u>\$ 173.7</u>	<u>\$ 137.2</u>

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NOTE 5. ACQUISITIONS

MRK

On November 25, 2019, we acquired the business and assets of MRK. The \$13.5 million purchase price was allocated to the assets acquired and the liabilities assumed based on their estimated fair values, with the remaining unallocated amount recorded as goodwill. The total fair value of tangible assets acquired, less liabilities assumed, was \$2.8 million, resulting in \$10.7 million of goodwill. All of the acquired goodwill is deductible for tax purposes. These amounts are subject to adjustment in connection with our ongoing purchase accounting analysis.

ACGI

On March 4, 2019, we acquired the business and assets of ACGI. The \$42.9 million purchase price was allocated to the assets acquired and the liabilities assumed based on their estimated fair values, with the remaining unallocated amount recorded as goodwill. The total fair value of tangible assets acquired, less liabilities assumed, was \$8.3 million. The total fair value of identifiable intangible assets acquired was \$12.0 million, mostly comprised of amortizable customer relationships of \$7.4 million and amortizable tradenames of \$2.8 million, resulting in \$22.6 million of goodwill. All of the acquired goodwill is deductible for tax purposes. These amounts are subject to adjustment in connection with our ongoing purchase accounting analysis.

STEEL CEILINGS

On August 16, 2018, we acquired the business and assets of Steel Ceilings. The \$12.3 million purchase price was allocated to the assets acquired and the liabilities assumed based on their estimated fair values, with the remaining amount recorded as goodwill. In October 2018, we sold certain assets related to an acquired product line to WAVE for \$2.0 million. The total fair value of tangible assets acquired, less liabilities assumed, was \$4.4 million. The total fair value of identifiable intangible assets acquired was mostly comprised of amortizable customer relationships of \$1.4 million and tradenames of \$1.3 million, resulting in \$3.2 million of goodwill. All of the acquired goodwill is deductible for tax purposes.

PLASTERFORM

On May 31, 2018, we acquired the business and assets of Plasterform. The \$11.9 million purchase price was allocated to the assets acquired and the liabilities assumed based on their estimated fair values, with the remaining amount recorded as goodwill. The total fair value of tangible assets acquired, less liabilities assumed, was \$2.2 million. The total fair value of identifiable intangible assets acquired, comprised of amortizable customer relationships, was \$4.8 million, resulting in \$4.9 million of goodwill. All of the acquired goodwill is deductible for tax purposes.

TECTUM

On January 13, 2017, in connection with the acquisition of Tectum, the \$31.2 million purchase price was allocated to the tangible and intangible assets acquired and the liabilities assumed based on their estimated fair values, with the remaining unallocated amount recorded as goodwill. The total fair value of tangible assets acquired, less liabilities assumed, in connection with the Tectum acquisition was \$4.4 million. The total fair value of intangible assets acquired, comprised of amortizable customer relationships and non-amortizing brand names, was \$16.0 million, resulting in \$10.8 million of goodwill. All of the acquired goodwill is deductible for tax purposes.

The 2017, 2018 and 2019 acquisitions, both individually and in the aggregate, did not have a material impact on reported net sales or operating income for the years ended December 31, 2019, 2018 and 2017.

NOTE 6. DISCONTINUED OPERATIONS

EMEA AND PACIFIC RIM BUSINESSES

On November 17, 2017, we agreed to sell certain subsidiaries comprising our businesses in EMEA and the Pacific Rim to Knauf. The Sale was completed on September 30, 2019.

Prior to completion of the Sale, each quarter, we compared the anticipated sales proceeds from Knauf to the carrying value of EMEA and Pacific Rim net assets. We recorded an estimated loss when the carrying value exceeded the anticipated sales proceeds. Net gains were only recorded to the extent of previous estimated losses. Upon completion of the Sale, we compared the actual proceeds we received from Knauf to the carrying value of EMEA and Pacific Rim net assets, and recorded an additional loss. In 2017, we recorded



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an estimated loss of \$74.0 million, which included \$51.4 million of unfavorable Accumulated Other Comprehensive Income (“AOCI”) adjustments. In 2018, we recorded an estimated loss of \$19.3 million, which included \$25.5 million of unfavorable AOCI adjustments. During the second quarter of 2019, we recorded an immaterial correction related to the previously reported estimated loss on sale of our EMEA and Pacific Rim businesses. The correction increased the estimated loss on sale and reduced the assets held for sale by \$35.2 million as of December 31, 2017. In 2019, we recorded a net loss of \$31.2 million, which included \$6.8 million of unfavorable AOCI adjustments. The AOCI adjustments related primarily to accumulated foreign currency translation amounts that were reclassified from AOCI as of September 30, 2019. The transaction and final gain or loss amount are subject to finalization of customary working capital and other adjustments, as provided in the Purchase Agreement.

See Note 1 for further discussion of the Sale.

FLOORING BUSINESSES

Separation and Distribution of AFI

On April 1, 2016, we completed our separation of Armstrong Flooring, Inc. (“AFI”) by allocating the assets and liabilities related primarily to our Resilient and Wood Flooring segments to AFI and then distributing the common stock of AFI to our shareholders at a ratio of one share of AFI common stock for every two shares of AWI common stock. The income tax benefit presented in the table below for the year ended December 31, 2019 relates primarily to the release of a reserve for the 2015 tax year.

In connection with the separation and distribution of AFI, we entered into several agreements with AFI that, together with a plan of division, provide for the separation and allocation between AWI and AFI of the flooring assets, employees, liabilities and obligations of AWI and its subsidiaries attributable to periods prior to, at and after AFI’s separation from AWI, and governed the relationship between AWI and AFI subsequent to the completion of the separation and distribution. These agreements included a Tax Matters Agreement, an Employee Matters Agreement, a Trademark License Agreement, a Transition Trademark License Agreement and a Campus Lease Agreement.

Summarized Financial Information of Discontinued Operations

The following tables detail the businesses and line items that comprise discontinued operations on the Consolidated Statements of Earnings and Comprehensive Income.

	<b>EMEA and Pacific Rim Businesses</b>	<b>Flooring Businesses</b>	<b>Total</b>
<u>2019</u>			
Net sales	\$ 319.1	\$ -	\$ 319.1
Cost of goods sold	245.7	-	245.7
Gross profit	73.4	-	73.4
Selling, general and administrative expenses	61.6	-	61.6
Operating income	11.8	-	11.8
Other non-operating expense, net	1.6	-	1.6
Earnings from discontinued operations before income tax	10.2	-	10.2
Income tax expense	12.0	-	12.0
Net (loss) from discontinued operations, net of tax	<u>\$ (1.8)</u>	<u>\$ -</u>	<u>\$ (1.8)</u>
(Loss) from disposal of discontinued businesses, before income tax	\$ (31.2)	\$ -	\$ (31.2)
Income tax (benefit)	-	(5.2)	(5.2)
(Loss) gain from disposal of discontinued businesses, net of tax	<u>\$ (31.2)</u>	<u>\$ 5.2</u>	<u>\$ (26.0)</u>
Net (loss) earnings from discontinued operations	<u>\$ (33.0)</u>	<u>\$ 5.2</u>	<u>\$ (27.8)</u>

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	<b>EMEA and Pacific Rim Businesses</b>	<b>Flooring Businesses</b>	<b>Total</b>
<u>2018</u>			
Net sales	\$ 446.1	\$ -	\$ 446.1
Cost of goods sold	341.4	-	341.4
Gross profit	104.7	-	104.7
Selling, general and administrative expenses	85.8	-	85.8
Operating income	18.9	-	18.9
Interest expense	1.4	-	1.4
Other non-operating (income), net	(0.3)	-	(0.3)
Earnings from discontinued operations before income tax	17.8	-	17.8
Income tax expense	8.2	-	8.2
Net earnings from discontinued operations, net of tax	<u>\$ 9.6</u>	<u>\$ -</u>	<u>\$ 9.6</u>
(Loss) from disposal of discontinued businesses, before income tax	\$ (19.3)	\$ -	\$ (19.3)
Income tax (benefit)	-	(6.0)	(6.0)
(Loss) gain from disposal of discontinued businesses, net of tax	<u>\$ (19.3)</u>	<u>\$ 6.0</u>	<u>\$ (13.3)</u>
Net (loss) earnings from discontinued operations	<u>\$ (9.7)</u>	<u>\$ 6.0</u>	<u>\$ (3.7)</u>
	<b>EMEA and Pacific Rim Businesses</b>	<b>Flooring Businesses</b>	<b>Total</b>
<u>2017</u>			
Net sales	\$ 436.2	\$ -	\$ 436.2
Cost of goods sold	350.8	-	350.8
Gross profit	85.4	-	85.4
Selling, general and administrative expenses	78.3	-	78.3
Operating income	7.1	-	7.1
Interest expense	1.2	-	1.2
Other non-operating (income), net	(1.9)	-	(1.9)
Earnings from discontinued operations before income tax	7.8	-	7.8
Income tax expense	3.6	-	3.6
Net earnings from discontinued operations, net of tax	<u>\$ 4.2</u>	<u>\$ -</u>	<u>\$ 4.2</u>
(Loss) from disposal of discontinued businesses, before income tax	\$ (109.2)	\$ (0.1)	\$ (109.3)
Income tax (benefit)	-	(4.1)	(4.1)
(Loss) gain from disposal of discontinued businesses, net of tax	<u>\$ (109.2)</u>	<u>\$ 4.0</u>	<u>\$ (105.2)</u>
Net (loss) earnings from discontinued operations	<u>\$ (105.0)</u>	<u>\$ 4.0</u>	<u>\$ (101.0)</u>

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The following is a summary of the carrying amount of the major classes of assets and liabilities classified as assets and liabilities of discontinued operations as of December 31, 2018 related to our former EMEA and Pacific Rim businesses.

	<u>December 31, 2018</u>
<u>Assets</u>	
Current assets:	
Cash and cash equivalents	\$ 10.0
Accounts and notes receivable, net	56.2
Inventories, net	59.8
Income tax receivable	1.8
Other current assets	8.2
Total current assets discontinued operations	136.0
Property, plant, and equipment, less accumulated depreciation and amortization <sup>(1)(2)</sup>	68.6
Prepaid pension costs <sup>(1)</sup>	28.9
Goodwill and intangible assets, net <sup>(1)</sup>	6.8
Deferred income taxes <sup>(1)</sup>	3.0
Other non-current assets <sup>(1)</sup>	1.0
Total non-current assets of discontinued operations <sup>(1)</sup>	108.3
Total assets of discontinued operations <sup>(1)</sup>	\$ 244.3
<u>Liabilities</u>	
Current liabilities:	
Accounts payable and accrued expenses	\$ 67.1
Income tax payable	1.1
Total current liabilities	68.2
Pension benefit liabilities <sup>(3)</sup>	33.8
Other long-term liabilities <sup>(3)</sup>	1.8
Income taxes payable <sup>(3)</sup>	-
Deferred income taxes <sup>(3)</sup>	6.5
Total non-current liabilities of discontinued operations <sup>(3)</sup>	42.1
Total liabilities of discontinued operations <sup>(3)</sup>	\$ 110.3

- (1) Presented as Assets of discontinued operations on the Consolidated Balance Sheets.  
(2) Includes pre-tax estimated losses of \$128.5 million.  
(3) Presented as Liabilities of discontinued operations on the Consolidated Balance Sheets.

The following is a summary of total depreciation and amortization, estimated losses, capital expenditures and operating lease information related to our former EMEA and Pacific Rim businesses which are presented as discontinued operations and included as components of operating and investing cash flows on our Consolidated Statements of Cash Flows:

	2019	2018	2017
Depreciation and amortization	\$ -	\$ -	\$ 22.2
Estimated loss on sale to Knauf <sup>(1)</sup>	31.2	19.3	109.2
Purchases of property, plant and equipment	(3.0)	(7.3)	(12.0)
Operating lease cost <sup>(2)</sup>	7.4	-	-
ROU assets obtained in exchange for lease obligations <sup>(3)</sup>	24.6	-	-

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- (1) Loss on sale for the years ended December 31, 2018 and 2017 represents the comparison of the EMEA and Pacific Rim net assets to the expected sales proceeds.
- (2) We do not believe the amount of cash paid for amounts included in the measurement of lease liabilities to be materially different from the operating lease cost for the nine months ended September 30, 2019.
- (3) Represents initial ROU assets recognized upon adoption on January 1, 2019. We did not obtain any new ROU assets in exchange for lease obligations during the nine months ended September 30, 2019.

**NOTE 7. ACCOUNTS AND NOTES RECEIVABLE**

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Customer receivables	\$ 82.4	\$ 70.4
Miscellaneous receivables	5.0	11.5
Less allowance for warranties, discounts and losses	(2.3)	(2.0)
Accounts and notes receivable, net	<u>\$ 85.1</u>	<u>\$ 79.9</u>

We sell our products to select, pre-approved customers whose businesses are affected by changes in economic and market conditions. We consider these factors and the financial condition of each customer when establishing our allowance for losses from doubtful accounts.

Miscellaneous receivables as of December 31, 2018 included \$6.5 million of insurance recoveries related to environmental matters, which were collected during the first quarter of 2019. See Note 27 for additional information.

**NOTE 8. INVENTORIES**

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Finished goods	\$ 40.2	\$ 38.8
Goods in process	4.0	4.4
Raw materials and supplies	35.0	27.8
Less LIFO reserves	(10.7)	(9.8)
Total inventories, net	<u>\$ 68.5</u>	<u>\$ 61.2</u>

Approximately 73% and 76% of our total inventory in 2019 and 2018, respectively, were valued on a Last-in, first-out (“LIFO”) basis.

The distinction between the use of different methods of inventory valuation is primarily based on legal entities and/or geographical locations. The following table summarizes the amount of inventory that is not accounted for under the LIFO method.

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
U.S. locations	\$ 15.3	\$ 11.8
Canada locations	3.2	2.9
Total	<u>\$ 18.5</u>	<u>\$ 14.7</u>

Our Canadian locations use the First-in, first-out (“FIFO”) method of inventory valuation (or other methods which closely approximate the FIFO method) primarily because the LIFO method is not permitted for local tax and/or statutory reporting purposes. In these situations, a conversion to LIFO would be highly complex and involve excessive cost and effort to achieve under local tax and/or statutory reporting requirements. U.S. locations that use the FIFO method of inventory valuation primarily represent certain finished goods sourced from third party suppliers and recent acquisitions.

**NOTE 9. OTHER CURRENT ASSETS**

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Prepaid expenses	\$ 7.5	\$ 4.1
Assets held for sale	6.6	-
Other	1.4	0.7
Total other current assets	<u>\$ 15.5</u>	<u>\$ 4.8</u>

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As of December 31, 2019, assets held for sale include the property, plant and equipment of our idle mineral fiber plant in China, as we entered into a sale agreement during the third quarter of 2019 with closing expected in the second quarter of 2020.

NOTE 10. PROPERTY, PLANT AND EQUIPMENT

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Land	\$ 32.6	\$ 32.4
Buildings	239.5	232.5
Machinery and equipment	624.8	575.4
Computer software	33.4	23.8
Construction in progress	41.8	49.8
Less accumulated depreciation and amortization	(447.5)	(412.9)
Net property, plant and equipment	<u>\$ 524.6</u>	<u>\$ 501.0</u>

NOTE 11. EQUITY INVESTMENTS

Investment in joint venture as of December 31, 2019 reflected the equity interest in our 50% investment in our WAVE joint venture. The WAVE joint venture is reflected within the Mineral Fiber segment in our consolidated financial statements using the equity method of accounting.

We use the cumulative earnings approach to determine the appropriate classification of distributions from WAVE within our cash flow statement. During 2019, 2018 and 2017, WAVE distributed amounts in excess of our capital contributions and proportionate share of retained earnings. Accordingly, the distributions in these years were reflected as a return of investment in cash flows from investing activity in our Consolidated Statement of Cash Flows. Distributions from WAVE in 2019, 2018 and 2017, were \$85.2 million, \$141.7 million, and \$69.1 million, respectively.

In certain markets, we sell WAVE products directly to customers pursuant to specific terms of sale. In those circumstances, we record the sales and associated costs within our consolidated financial statements. The total sales associated with these transactions were \$33.5 million, \$32.8 million and \$31.2 million for the years ended 2019, 2018 and 2017, respectively.

The European and Pacific Rim businesses of WAVE were included in the Sale to Knauf on September 30, 2019. Accordingly, WAVE's European and Pacific Rim historical financial statement results have been reflected in WAVE's consolidated financial statements as a discontinued operation for all periods presented. Our equity earnings in joint venture reflected as a component of earnings from continuing operations included \$3.0 million, \$1.5 million and \$1.7 million of equity earnings representing WAVE's net earnings from operations of its discontinued European and Pacific Rim businesses in 2019, 2018 and 2017, respectively. Condensed financial data for WAVE is summarized below on a continuing operations basis.

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Current assets	\$ 99.2	\$ 112.9
Current assets of discontinued operations	-	33.8
Noncurrent assets	37.0	34.9
Current liabilities	24.4	113.6
Current liabilities of discontinued operations	-	6.9
Other noncurrent liabilities	287.4	293.6

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Net sales	\$ 393.2	\$ 375.0	\$ 344.5
Gross profit	219.6	205.8	192.7
Net earnings	166.0	156.6	144.3

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In connection with the sale of WAVE’s European and Pacific Rim businesses and operations to Knauf on September 30, 2019, WAVE recorded a \$46.2 million gain on sale during 2019, which included \$10.2 million of unfavorable AOCI adjustments. As such, during 2019, we recorded our share of WAVE’s gain on sale of discontinued operations of \$20.6 million, which was included as a component of Equity earnings from joint venture in our Consolidated Statements of Earnings and Comprehensive Income. The transaction and final gain amount is subject to finalization of customary working capital and other adjustments, as provided in the Purchase Agreement.

Our recorded investment in WAVE was higher than our 50% share of the carrying values reported in WAVE’s consolidated financial statements by \$145.8 million as of December 31, 2019 and \$155.5 million as of December 31, 2018. These differences are due to our adoption of fresh-start reporting upon emergence from Chapter 11 in October 2006, while WAVE’s consolidated financial statements do not reflect fresh-start reporting. The differences are composed of the following fair value adjustments to assets:

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Property, plant and equipment	\$ 0.4	\$ 0.4
Other intangibles	115.0	124.7
Goodwill	30.4	30.4
Total	\$ 145.8	\$ 155.5

Other intangibles include customer relationships, trademarks and developed technology. Customer relationships are amortized over 20 years and developed technology is amortized over 15 years. Trademarks have an indefinite life. During the third quarter of 2019, we wrote off \$4.4 million of customer relationships and developed technology intangible assets attributed to WAVE’s European and Pacific Rim businesses included in the Sale. This write-off was included as a reduction to Equity earnings from joint venture in our Consolidated Statements of Earnings and Comprehensive Income.

Management regularly evaluates its investment in WAVE for impairment, including performing an evaluation as a result of the sale of WAVE’s European and Pacific Rim businesses to Knauf. Based on that evaluation, management concluded that its investment in WAVE was not impaired.

See discussion in Note 26 to the Consolidated Financial Statements for additional information on this related party.

**NOTE 12. LEASES**

We enter into operating leases for certain manufacturing plants, warehouses, equipment and automobiles. Our leases have remaining lease terms of 1 to 14 years. Several leases include options for us to purchase leased items at fair value or renew for up to 5 years, or multiple 5-year renewal periods. Some of our leases include early termination options. We consider all of these options in determining the lease term used to establish our ROU assets and lease liabilities when it is reasonably certain that we will exercise that option. Our lease agreements do not contain any residual value guarantees or material restrictive covenants.

We have lease agreements with lease and non-lease components, which are accounted for separately. Short-term leases with an initial term of 12 months or less are not recorded on the balance sheet. We recognize lease expense for these leases on a straight-line basis over the lease term. Short-term lease expense was not material for the year ended December 31, 2019.

As most of our leases do not provide an implicit rate, we use our incremental borrowing rate (“IBR”) based on information that is available at the lease commencement date to compute the present value of lease payments. Relevant information used in determining the IBR includes the transactional currency of the lease and the lease term. We used the IBR on January 1, 2019 for operating leases that commenced prior to that date. As of December 31, 2019, we do not have any finance leases and we have no additional operating leases that have not yet commenced.

As noted in Note 2, effective January 1, 2019, we adopted ASC Topic 842 – Leases using the modified retrospective transition method. As such, we did not restate financial statement and lease disclosure data for all periods prior to January 1, 2019, which was prepared in accordance with ASC Topic 840 – Leases.

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The following tables present our operating lease cost and supplemental cash flow information related to our operating leases:

	<b>2019</b>
Operating lease cost	\$ 6.8
ROU assets obtained in exchange for lease obligations <sup>(1)</sup>	\$ 41.6

(1) Includes initial ROU assets of \$29.2 million recognized upon adoption on January 1, 2019.

We do not believe the amount of cash paid for amounts included in the measurement of lease liabilities to be materially different from our operating lease cost for the year ended December 31, 2019.

The following table presents supplemental balance sheet information related to our operating leases:

	<b>Balance Sheet Classification</b>	<b>December 31, 2019</b>
ROU assets	Lease right-of-use assets	\$ 35.3
Current lease liabilities	Accounts payable and accrued expenses	5.2
Non-current lease liabilities	Lease non-current liabilities	30.1

The following table presents the weighted average assumptions used to compute our ROU assets and lease liabilities:

	<b>December 31, 2019</b>
Weighted average remaining lease term (in years)	8.6
Weighted average discount rate	4.4%

Undiscounted future minimum lease payments as of December 31, 2019, by year and in the aggregate, having non-cancelable lease terms in excess of one year are as follows:

	<b>Maturities of Lease Liabilities</b>
2020	\$ 6.6
2021	5.8
2022	5.1
2023	4.4
2024	3.6
Thereafter	17.5
Total lease payments	43.0
Less interest	(7.7)
Present value of lease liabilities	\$ 35.3

Future minimum lease payments as of December 31, 2018, by year and in the aggregate, having non-cancelable lease terms in excess of one year were expected to be as follows:

	<b>Total Minimum Lease Payments</b>
2019	\$ 5.3
2020	4.7
2021	4.2
2022	3.7
2023	2.2
Thereafter	4.7
Total	\$ 24.8

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Rent expense was \$6.1 million and \$6.7 in 2018 and 2017, respectively.

**NOTE 13. GOODWILL AND INTANGIBLE ASSETS**

We conduct our annual impairment testing of goodwill and non-amortizing intangible assets during the fourth quarter. The 2019, 2018 and 2017 reviews concluded that no impairment charges were necessary. See Note 2 to the Consolidated Financial Statements for a discussion of our accounting policy for goodwill and intangible assets.

The following table details amounts related to our goodwill and intangible assets as of December 31, 2019 and 2018:

	Estimated Useful Life	December 31, 2019		December 31, 2018	
		Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
<u>Amortizing intangible assets</u>					
Customer relationships	3-20 years	\$ 188.9	\$ 114.9	\$ 181.4	\$ 103.0
Developed technology	15 years	85.0	72.1	84.3	66.5
Trademarks and brand names	5-20 years	3.9	0.6	1.1	0.2
Other	Various	0.3	0.1	5.6	1.2
Total		<u>\$ 278.1</u>	<u>\$ 187.7</u>	<u>\$ 272.4</u>	<u>\$ 170.9</u>
<u>Non-amortizing intangible assets</u>					
Trademarks and brand names	Indefinite	321.5		321.3	
Total intangible assets		<u>\$ 599.6</u>		<u>\$ 593.7</u>	
Goodwill	Indefinite	<u>\$ 53.0</u>		<u>\$ 19.2</u>	

The increase in goodwill as of December 31, 2019 resulted from the acquisitions of ACGI and MRK, net of foreign exchange movements. See Note 5 to the Consolidated Financial Statements for additional details.

	2019	2018	2017
Amortization expense	\$ 19.9	\$ 15.1	\$ 14.6

The expected annual amortization expense for the years 2020 through 2024 are as follows:

2020	\$ 18.6
2021	17.2
2022	11.1
2023	10.7
2024	10.3

**NOTE 14. OTHER NON-CURRENT ASSETS**

	December 31, 2019	December 31, 2018
Cash surrender value of Company owned life insurance policies	\$ 53.5	\$ 54.3
Fair value of derivative assets	1.3	9.6
Other	3.1	4.6
Total other non-current assets	<u>\$ 57.9</u>	<u>\$ 68.5</u>



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NOTE 15. ACCOUNTS PAYABLE AND ACCRUED EXPENSES

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Payables, trade and other	\$ 79.4	\$ 82.2
Current portion of lease liabilities	5.2	-
Employment costs	16.5	18.6
Current portion of pension and postretirement liabilities	10.5	10.9
Advance receipt of Knauf proceeds	-	202.4
Payable to Knauf for purchase price adjustments	1.2	-
Contingent liability payable to Knauf for adjustments to cash consideration	-	35.2
Payable to WAVE for receipt of Knauf proceeds	25.9	22.4
Other	10.0	11.6
Total accounts payable and accrued expenses	<u>\$ 148.7</u>	<u>\$ 383.3</u>

NOTE 16. INCOME TAXES

The tax effects of principal temporary differences between the carrying amounts of assets and liabilities and their tax basis are summarized below. Management believes it is more likely than not that the results of future operations will generate sufficient taxable income in the appropriate jurisdiction to realize deferred tax assets, net of valuation allowances. In arriving at this conclusion, we considered the profit before tax generated for the years 2017 through 2019, future reversals of existing taxable temporary differences, and projections of future profit before tax.

We reduce the carrying amounts of deferred tax assets by a valuation allowance if, based on the available evidence, it is more likely than not that such assets will not be realized. The need to establish valuation allowances for deferred tax assets is assessed quarterly. In assessing the requirement for, and amount of, a valuation allowance in accordance with the more likely than not standard for all periods, we give appropriate consideration to all positive and negative evidence related to the realization of the deferred tax assets. This assessment considers, among other matters, the nature, frequency and severity of current and cumulative losses, forecasts of future profitability, the duration of statutory carryforward periods, and our experience with operating loss and tax credit carryforward expirations. A history of cumulative losses is a significant piece of negative evidence used in our assessment. If a history of cumulative losses is incurred for a tax jurisdiction, forecasts of future profitability are not used as positive evidence related to the realization of the deferred tax assets in the assessment.

As of December 31, 2019 and 2018, we had \$897.3 million and \$954.5 million, respectively, of gross state net operating loss (“NOL”) carryforwards expiring between 2020 and 2039. As of December 31, 2019, we also had foreign tax credits (“FTC”) carryforwards of \$13.1 million that expire between 2020 and 2028. U.S. FTC carryforwards as of December 31, 2018 were \$19.1 million. As of December 31, 2019, we also had capital loss carryforwards of \$16.0 million that expire between 2024 and 2034.

As of December 31, 2019 and 2018, we had valuation allowances of \$75.5 million and \$79.6 million, respectively. As of December 31, 2019, our valuation allowance consisted of \$13.1 million for federal deferred tax assets related to FTC carryforwards, \$46.4 million for state deferred tax assets related to operating loss carryforwards, and \$16.0 million for federal and state deferred tax assets related to capital loss carryovers.

We estimate we will need to generate future federal taxable foreign source income of \$62.4 million to fully realize FTC carryforwards before they expire in 2028. We estimate we will need to generate future taxable income of approximately \$681.6 million for state income tax purposes during the respective realization periods (ranging from 2020 to 2039) in order to fully realize the net deferred income tax assets discussed above. We estimate we will need to generate capital gain income of \$56.2 million to fully realize our capital loss carryforwards before they expire in 2034. Our ability to utilize deferred tax assets may be impacted by certain future events, such as changes in tax legislation or insufficient future taxable income prior to expiration of certain deferred tax assets.

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	<u>December 31, 2019</u>	<u>December 31, 2018</u>
<u>Deferred income tax assets (liabilities)</u>		
Net operating losses	\$ 54.8	\$ 58.7
Postretirement benefits	21.2	18.2
Pension benefit liabilities	12.9	14.3
Deferred compensation	10.5	11.8
Undistributed foreign earnings	-	32.5
Foreign tax credit carryforwards	13.1	19.1
State tax credit carryforwards	9.3	9.8
Capital loss carryforwards	16.0	-
Lease right-of-use liabilities	9.0	-
Other	9.0	17.1
Total deferred income tax assets	<u>155.8</u>	<u>181.5</u>
Valuation allowances	<u>(75.5)</u>	<u>(79.6)</u>
Net deferred income tax assets	<u>80.3</u>	<u>101.9</u>
Intangibles	(126.2)	(132.3)
Accumulated depreciation	(69.7)	(62.0)
Prepaid pension costs	(24.2)	(11.5)
Inventories	(4.5)	(5.5)
Lease right-of-use assets	(9.0)	-
Other	<u>(0.2)</u>	<u>(0.2)</u>
Total deferred income tax liabilities	<u>(233.8)</u>	<u>(211.5)</u>
Net deferred income tax liabilities	<u>\$ (153.5)</u>	<u>\$ (109.6)</u>
Deferred income taxes have been classified in the Consolidated Balance Sheet as:		
Deferred income tax assets - non-current	\$ 10.4	\$ 14.8
Deferred income tax liabilities - non-current	<u>(163.9)</u>	<u>(124.4)</u>
Net deferred income tax liabilities	<u>\$ (153.5)</u>	<u>\$ (109.6)</u>

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	2019	2018	2017
<u>Details of taxes</u>			
Earnings (loss) from continuing operations before income taxes:			
Domestic	\$ 299.7	\$ 234.0	\$ 224.1
Foreign	(0.3)	8.7	(2.0)
Total	\$ 299.4	\$ 242.7	\$ 222.1
Income tax expense (benefit):			
Current:			
Federal	\$ 31.4	\$ 45.7	\$ 26.2
Foreign	0.8	2.1	1.4
State	6.3	8.0	4.7
Total current	38.5	55.8	32.3
Deferred:			
Federal	15.1	(3.7)	(36.6)
Foreign	(0.3)	-	(0.1)
State	3.8	1.0	5.9
Total deferred	18.6	(2.7)	(30.8)
Total income tax expense	\$ 57.1	\$ 53.1	\$ 1.5

We reviewed our position with regards to foreign unremitted earnings and determined that unremitted earnings will not be permanently reinvested as a result of the Sale. Accordingly, in 2019, we had recorded foreign withholding taxes of \$0.8 million on approximately \$14.0 million of net undistributed earnings of foreign subsidiaries. In 2018, we had foreign withholding taxes accrued of \$2.2 million on approximately \$208.0 million of net undistributed earnings of foreign subsidiaries.

	2019	2018	2017
<u>Reconciliation to U.S. statutory tax rate</u>			
Continuing operations tax at statutory rate	\$ 62.9	\$ 51.0	\$ 77.7
Increase in valuation allowances on deferred domestic income tax assets	0.1	10.0	9.1
State income tax expense, net of federal benefit	12.4	9.2	7.9
Domestic production activities	-	-	(5.8)
Statute closures	(3.8)	(9.6)	(2.3)
State deferred tax adjustments	(1.9)	-	-
Capital loss utilization on WAVE earnings	(4.4)	-	-
2017 Tax Act <sup>(1)</sup>	-	(1.2)	(82.5)
Excess tax benefits on share-based compensation	(3.2)	(3.8)	-
Tax on foreign and foreign-source income	(1.9)	(4.4)	-
Other	(3.1)	1.9	(2.6)
Tax expense at effective rate	\$ 57.1	\$ 53.1	\$ 1.5

- (1) On December 22, 2017, the U.S. federal government enacted the 2017 Tax Act, resulting in significant changes from existing U.S. tax laws that impact us, including, but not limited to, reducing the U.S. federal corporate income tax rate from 35% to 21%, allowing immediate 100% deduction for the cost of qualified property, eliminating the domestic production activities deduction, and imposing a one-time transition tax in 2017 on the cumulative earnings and profits of certain foreign subsidiaries that were previously not repatriated and therefore not taxed for U.S. income tax purposes. Our federal income tax expense is based on the new 21% rate for periods beginning in 2018.

We recognize the tax benefits of an uncertain tax position only if those benefits are more likely than not to be sustained based on existing tax law. Additionally, we establish a reserve for tax positions that are more likely than not to be sustained based on existing tax law, but uncertain in the ultimate benefit to be sustained upon examination by the relevant taxing authorities. Unrecognized tax benefits are subsequently recognized at the time the more likely than not recognition threshold is met, the tax matter is effectively settled or the statute of limitations for the relevant taxing authority to examine and challenge the tax position has expired, whichever is earlier.

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We have \$34.7 million of Unrecognized Tax Benefits (“UTB”) as of December 31, 2019, \$17.2 million (\$16.1 million, net of federal benefit) of this amount, if recognized in future periods, would impact the reported effective tax rate.

It is reasonably possible that certain UTB’s may increase or decrease within the next twelve months due to tax examination changes, settlement activities, expirations of statute of limitations, or the impact on recognition and measurement considerations related to the results of published tax cases or other similar activities. Over the next twelve months we estimate that UTB’s may decrease by \$0.6 million related to state statutes expiring and increase by \$1.8 million due to uncertain tax positions expected to be taken on domestic tax returns.

We account for all interest and penalties on uncertain income tax positions as income tax expense. We have \$2.2 million of interest and penalties accrued in noncurrent income tax payable in the Consolidated Balance Sheet as of December 31, 2019.

We had the following activity for UTB’s for the years ended December 31, 2019, 2018 and 2017:

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Unrecognized tax benefits balance at January 1,	\$ 42.6	\$ 53.4	\$ 86.9
Gross change for current year positions	2.2	3.6	(2.2)
Increases for prior period positions	-	1.1	2.9
Decrease for prior period positions	(2.1)	(2.0)	(0.1)
Decrease due to statute expirations	(8.0)	(13.5)	(34.1)
Unrecognized tax benefits balance at December 31,	<u>\$ 34.7</u>	<u>\$ 42.6</u>	<u>\$ 53.4</u>

We file income tax returns in the U.S., various states and international jurisdictions. In the normal course of business, we are subject to examination by taxing authorities in Canada and the United States. Generally, we have open tax years subject to tax audit on average of between three years and six years. The statute of limitations is no longer open for U.S. federal returns before 2016. With few exceptions, the statute of limitations is no longer open for state or non-U.S. income tax examinations for the years before 2014. We have not significantly extended any open statutes of limitation for any major jurisdiction and have reviewed and accrued for, where necessary, tax liabilities for open periods.

	<u>2019</u>	<u>2018</u>	<u>2017</u>
<u>Other taxes</u>			
Payroll taxes	\$ 16.0	\$ 15.6	\$ 14.2
Property, franchise and capital stock taxes	3.8	3.7	4.0

NOTE 17. DEBT

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Revolving credit facility due 2024	\$ 115.0	\$ -
Term loan A due 2021	-	547.5
Term loan A due 2024	500.0	-
Term loan B due 2023	-	243.1
Tax exempt bonds due 2041	-	35.0
Principal debt outstanding	<u>615.0</u>	<u>825.6</u>
Unamortized debt financing costs	(4.2)	(5.8)
Long-term debt	610.8	819.8
Less current portion and short-term debt	<u>6.3</u>	<u>55.0</u>
Total long-term debt, less current portion	<u>\$ 604.5</u>	<u>\$ 764.8</u>

As of June 30, 2019, total principal debt outstanding under our \$1,050.0 million variable rate senior credit facility was \$525.0 million under Term Loan A and \$241.9 million under Term Loan B, with no borrowings outstanding under the revolving credit facility. On July 3, 2019, we used cash on hand to make a voluntary prepayment of \$100.0 million of the debt outstanding under Term Loan B. Term Loan B was priced at 2.75% over the London Interbank Offered Rate (“LIBOR”). On September 30, 2019, we refinanced our \$1,050.0 million variable rate senior credit facility, using cash on hand to pay down a portion of the debt outstanding, including the debt outstanding under Term Loan B. The \$1,000.0 million amended senior credit facility is composed of a \$500.0 million revolving

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credit facility (with a \$150.0 million sublimit for letters of credit) and a \$500.0 million Term Loan A. The terms of the amended credit facility resulted in a lower interest rate spread for both the revolving credit facility (2.00% to 1.50% over LIBOR) and Term Loan A (1.75% to 1.50% over LIBOR). We also extended the maturity of both the revolving credit facility and Term Loan A from April 2021 to September 2024. In connection with the refinancing, we paid \$3.0 million of bank, legal and other fees, of which \$2.9 million were capitalized. These fees are reflected as a component of long-term debt and amortized into interest expense over the lives of the underlying debt. Additionally, during the third quarter of 2019, we wrote off \$2.7 million of unamortized debt financing costs, included as a component of interest expense, related to our previous credit facility. Finally, in connection with the refinancing, we settled a \$100.0 million notional interest rate swap as of September 30, 2019. See Note 20 for additional details.

The refinanced senior credit facility includes two financial covenants that require the ratio of consolidated earnings before interest, taxes, depreciation and amortization (“EBITDA”) to consolidated cash interest expense minus cash consolidated interest income to be greater than or equal to 3.0 to 1.0 and requires the ratio of consolidated funded indebtedness, minus AWI and domestic subsidiary unrestricted cash and cash equivalents up to \$100 million, to EBITDA to be less than or equal to 3.75 to 1.0. As of December 31, 2019, we were in compliance with all covenants of the senior credit facility.

Our debt agreements include other restrictions, including restrictions pertaining to the acquisition of additional debt, the redemption, repurchase or retirement of our capital stock, payment of dividends, and certain financial transactions as it relates to specified assets. We currently believe that default under these covenants is unlikely.

During the fourth quarter of 2019, we used proceeds from our revolving credit facility to pay off a \$35.0 million variable rate, tax exempt industrial development bond that financed the construction of a plant in prior years. The bond was remarketed by an agent on a regular basis at a market-clearing interest rate.

As of December 31, 2019, we had a \$25.0 million letter of credit facility, also known as our bi-lateral facility, and a \$36.2 million Accounts Receivable Securitization Facility with the Bank of Nova Scotia (the “funding entity”) that matures in March 2020. Under this facility, we sell accounts receivables to Armstrong Receivables Company, LLC (“ARC”), a Delaware entity that is consolidated in these financial statements. ARC is a 100% wholly-owned single member limited liability company special purpose entity created specifically for this transaction; therefore, any receivables sold to ARC are not available to the general creditors of AWI. ARC then sells an undivided interest in the purchased accounts receivables to the funding entity. This undivided interest acts as collateral for drawings on the facility. Any borrowings under this facility are obligations of ARC and not AWI. ARC contracts with and pays a servicing fee to AWI to manage, collect and service the purchased accounts receivables. All new receivables under the program are continuously purchased by ARC with the proceeds from collections of receivables previously purchased. During the first quarter of 2020, we expect to amend the facility to reduce the purchase limit from \$36.2 million to \$30.0 million and to extend its maturity to March 2021.

None of our remaining outstanding debt as of December 31, 2019 was secured with buildings and other assets. The credit lines under our revolving credit facility are subject to immaterial annual commitment fees.

Scheduled payments of long-term debt:

2020	\$	6.3
2021		25.0
2022		25.0
2023		25.0
2024		533.7
2025 and later		-

We utilize lines of credit and other commercial commitments in order to ensure that adequate funds are available to meet operating requirements. Letters of credit are currently arranged through our revolving credit facility, our bi-lateral facility and our securitization facility. Letters of credit may be issued to third party suppliers, insurance and financial institutions and typically can only be drawn upon in the event of AWI’s failure to pay its obligations to the beneficiary.

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The following table presents details related to our letters of credit:

<u>Financing Arrangements</u>	<u>December 31, 2019</u>		
	<u>Limit</u>	<u>Used</u>	<u>Available</u>
Accounts receivable securitization facility	\$ 36.2	\$ -	\$ 36.2
Bi-lateral facility	25.0	11.4	13.6
Revolving credit facility	150.0	-	150.0
Total	<u>\$ 211.2</u>	<u>\$ 11.4</u>	<u>\$ 199.8</u>

The maximum limit for letters of credit availability under our accounts receivable securitization facility is subject to securitized accounts receivable balances and other collateral adjustments. As of December 31, 2019 we had no letters of credit issued under our accounts receivable securitization facility. As of December 31, 2018, \$6.0 million of letters of credit issued under our accounts receivable securitization facility in excess of our maximum limit was classified as restricted cash and reported as a component of Cash and cash equivalents on our Consolidated Balance Sheets.

NOTE 18. PENSION AND OTHER BENEFIT PROGRAMS

DEFINED CONTRIBUTION BENEFIT PLANS

We sponsor several defined contribution plans, which cover substantially all U.S. and non-U.S. employees. Eligible employees may defer a portion of their pre-tax covered compensation on an annual basis. We match employee contributions up to pre-defined percentages. Employee contributions are 100% vested. Employer contributions are vested based on pre-defined requirements. Costs for defined contribution benefit plans were \$7.7 million in 2019, \$6.3 million in 2018 and \$6.2 million in 2017.

DEFINED BENEFIT PENSION PLANS

Benefits from defined benefit pension plans are based primarily on an employee's compensation and years of service. We fund our pension plans when appropriate.

Our U.S. defined benefit pension plans include both the qualified, funded RIP and the Retirement Benefit Equity Plan ("RBEP"), which is a nonqualified, unfunded plan designed to provide pension benefits in excess of the limits defined under Sections 415 and 401(a)(17) of the Internal Revenue Code.

Our RIP was amended to freeze accruals for salaried non-production employees, effective December 31, 2017. The impact of this amendment resulted in a reduction to our December 31, 2016 projected benefit obligation with a corresponding increase to unrecognized loss, resulting in no curtailment gain or loss. The impact of this amendment was reflected in the net periodic pension credit for 2017.

In 2017, certain RIP participants with deferred vested benefits were offered an opportunity to elect a lump sum distribution of the participant's entire accrued benefit. These distributions resulted in a partial plan settlement necessitating a plan remeasurement as of August 31, 2017. Settlement losses of \$20.8 million were recorded as components of other non-operating (income) expense, net during 2017.

Effective December 31, 2017, AWI merged the Tectum, Inc. Pension Plan (the "Tectum Plan") with and into the RIP. Tectum sponsored the Tectum Plan for the benefit of its eligible employees, which are limited to certain union employees at Tectum's Newark, Ohio plant.

We have a defined benefit pension plan in Germany which was not acquired by Knauf in connection with the Sale. This plan uses assumptions which are consistent with, but not identical to, those of the U.S. plans. The accumulated benefit obligation for the non-U.S. defined benefit pension plan was \$2.8 million and \$2.5 million as of December 31, 2019 and 2018, respectively.

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The following tables summarize the balance sheet impact of our U.S. defined benefit pension plans, as well as the related benefit obligations, assets, funded status and rate assumptions. We use a December 31 measurement date for all our defined benefit pension plans.

	<u>2019</u>	<u>2018</u>
Change in benefit obligation:		
Benefit obligation as of beginning of period	\$ 1,359.7	\$ 1,500.1
Service cost	4.8	5.7
Interest cost	50.3	46.1
Actuarial loss (gain)	117.0	(90.0)
Benefits paid	(100.4)	(102.2)
Benefit obligation as of end of period	<u>\$ 1,431.4</u>	<u>\$ 1,359.7</u>
	<u>2019</u>	<u>2018</u>
Change in plan assets:		
Fair value of plan assets as of beginning of period	\$ 1,360.4	\$ 1,529.7
Actual return on plan assets	214.4	(71.0)
Employer contributions	4.0	3.9
Benefits paid	(100.4)	(102.2)
Fair value of plan assets as of end of period	<u>\$ 1,478.4</u>	<u>\$ 1,360.4</u>
Funded status	<u>\$ 47.0</u>	<u>\$ 0.7</u>
	<u>2019</u>	<u>2018</u>
Weighted-average assumptions used to determine benefit obligations at end of period:		
Discount rate	3.16%	4.30%
Rate of compensation increase	3.05%	3.05%
Weighted-average assumptions used to determine net periodic benefit cost for the period:		
Discount rate	4.28%	3.62%
Expected return on plan assets	5.75%	6.50%
Rate of compensation increase	3.05%	3.05%

*Basis of Rate-of-Return Assumption*

Long-term asset class return assumptions for the RIP are determined based on input from investment professionals on the expected performance of the asset classes over 10 to 30 years. The forecasts were averaged to come up with consensus passive return forecasts for each asset class. Incremental components were added for the expected return from active management and asset class rebalancing based on historical information obtained from investment consultants. These forecasted gross returns were reduced by estimated management fees and expenses, yielding a long-term return forecast of 5.75% and 6.50% for the years ended December 31, 2019 and 2018.

The accumulated benefit obligation for the U.S. defined benefit pension plans was \$1,429.5 million and \$1,356.8 million as of December 31, 2019 and 2018, respectively.

	<u>2019</u>	<u>2018</u>
<u>Pension plans with benefit obligations in excess of assets</u>		
RBEP Projected benefit obligation, December 31	\$ 47.8	\$ 52.1
RBEP Accumulated benefit obligation, December 31	47.8	52.1

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The components of the pension (credit) cost for the U.S. defined benefit pension plans are as follows:

	2019	2018	2017
Service cost of benefits earned during the period	\$ 4.8	\$ 5.7	\$ 8.6
Interest cost on projected benefit obligation	50.3	46.1	48.1
Expected return on plan assets	(80.1)	(95.9)	(98.7)
Amortization of prior service cost	-	-	1.5
Recognized net actuarial loss	19.2	20.0	17.5
Partial settlement	-	-	20.8
Net periodic pension (credit) cost	<u>\$ (5.8)</u>	<u>\$ (24.1)</u>	<u>\$ (2.2)</u>

For 2019, 2018 and 2017, actuarial gains and losses were amortized over the remaining life expectancy of plan participants, which was approximately 17 years for 2019, 18 years for 2018 and 19 years for 2017 for our U.S. defined benefit pension plans.

Investment Policies

U.S. Pension Plans

The RIP's primary investment objective is to maintain the funded status of the plan such that the likelihood that we will be required to make significant contributions to the plan is limited. This objective is expected to be achieved by (a) investing a substantial portion of the plan assets in high quality corporate bonds whose duration is at least equal to that of the plan's liabilities, (b) investing in publicly traded equities in order to increase the ratio of plan assets to liabilities over time, (c) limiting investment return volatility by diversifying among additional asset classes with differing expected rates of return and return correlations, and (d) using derivatives to either implement investment positions efficiently or to hedge risk but not to create investment leverage.

Each asset class utilized by the RIP has defined asset allocation targets and allowable ranges. The table below shows the asset allocation targets and the December 31, 2019 and 2018 positions for each asset class:

Asset Class	Target Weight at December 31,	Position at December 31,	
	2019	2019 <sup>(1)</sup>	2018 <sup>(1)</sup>
	Long duration bonds	70.0%	69.0%
Equities, real estate and private equity	30.0%	30.0%	30.0%
High yield bonds and real assets	-	-	2.0%
Other	-	1.0%	6.0%

<sup>(1)</sup> Investments in collective trust funds as of December 31, 2019 and 2018 have been categorized within the asset classes above based on the underlying investments in those funds.

Pension plan assets are required to be reported and disclosed at fair value. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Three levels of inputs may be used to measure fair value:

Level 1 - Quoted prices in active markets for identical assets or liabilities.

Level 2 - Observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets; quoted prices for identical or similar assets and liabilities in markets that are not active; or other inputs that are observable or can be corroborated by observable market data.

Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. This includes certain pricing models, discounted cash flow methodologies and similar techniques that use significant unobservable inputs.



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The asset's fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques used need to maximize the use of observable inputs and minimize the use of unobservable inputs.

The following table sets forth by level within the fair value hierarchy a summary of the RIP plan assets measured at fair value on a recurring basis:

Description	Value at December 31, 2019			
	Level 1	Level 2	Level 3	Total
Bonds	\$ -	\$ 1,017.7	\$ -	\$ 1,017.7
Collective trust fund	-	434.6	-	434.6
Other investments	-	-	2.5	2.5
Cash, other short-term investments and payables, net	0.3	12.6	-	12.9
Net assets measured at fair value	<u>\$ 0.3</u>	<u>\$ 1,464.9</u>	<u>\$ 2.5</u>	<u>\$ 1,467.7</u>
Investments measured at net asset value				10.7
Net assets				<u>\$ 1,478.4</u>

Description	Value at December 31, 2018			
	Level 1	Level 2	Level 3	Total
Bonds	\$ -	\$ 832.2	\$ -	\$ 832.2
Collective trust fund	-	460.1	-	460.1
Other investments	-	-	2.6	2.6
Cash, other short-term investments and payables, net	(22.7)	24.2	-	1.5
Net assets measured at fair value	<u>\$ (22.7)</u>	<u>\$ 1,316.5</u>	<u>\$ 2.6</u>	<u>\$ 1,296.4</u>
Investments measured at net asset value				64.0
Net assets				<u>\$ 1,360.4</u>

RIP Level 3 assets remained relatively unchanged from December 31, 2018 to December 31, 2019, with the change in Level 3 assets during 2019 due primarily to fees, expenses and benefits paid.

The RIP has investments in alternative investment funds as of December 31, 2019 and 2018 which are reported at fair value. These investments that are measured at fair value using the net asset value ("NAV") per share (or its equivalent) practical expedient have not been categorized in the fair value hierarchy. The fair value amounts presented in the tables above are intended to permit reconciliation of the fair value hierarchy to the total fair value of plan assets. We have concluded that the NAV reported by the underlying fund approximates the fair value of the investment. These investments are redeemable at NAV under agreements with the underlying funds. However, it is possible that these redemption rights may be restricted or eliminated by the funds in the future in accordance with the underlying fund agreements. Due to the nature of the investments held by the funds, changes in market conditions and the economic environment may significantly impact the NAV of the funds and, consequently, the fair value of the U.S. defined benefit pension plan asset's interest in the funds. Furthermore, changes to the liquidity provisions of the funds may significantly impact the fair value of the U.S. defined benefit pension plan asset's interest in the funds. As of December 31, 2019, there were no restrictions on redemption of these investments.

The following table sets forth a summary of the RIP's investments measured at NAV:

Description	Value at December 31, 2019		Redemption Frequency	Redemption Notice Period
	Fair Value	Unfunded Commitments		
Real estate	\$ 10.7	\$ 2.2	Quarterly	60 days
Investments measured at net asset value	<u>\$ 10.7</u>	<u>\$ 2.2</u>		

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Description	Value at December 31, 2018		Redemption Frequency	Redemption Notice Period
	Fair Value	Unfunded Commitments		
Real estate	\$ 60.1	\$ 2.2	Quarterly	45-90 Days
Other investments	3.9	0.8	None	None
Investments measured at net asset value	<u>\$ 64.0</u>	<u>\$ 3.0</u>		

Following is a description of the valuation methodologies used for assets measured at fair value and at NAV.

**Bonds:** Consists of registered investment funds and common and collective trust funds investing in fixed income securities tailored to institutional investors. There are no readily available market quotations for registered investment company funds. The fair value of investment funds and common and collective trust funds have been classified as Level 2 assets above as their values were derived based on the underlying securities in the fund's portfolio which is typically the amount which the fund might reasonably expect to receive for the security upon a current sale. Investments in individual bonds were measured at fair value based on the closing price reported in the active market in which the bond is traded and investments in pooled funds traded in a non-active market were valued at bid price and classified as Level 2 assets above.

**Collective trust fund:** Represents collective trust and funds holding equity investments, fixed income securities, commodity futures contracts, cash and other short-term securities. The fair value of collective trust funds have been classified as Level 2 assets above as their values were derived based on the underlying securities in the fund's portfolio which is typically the amount which the fund might reasonably expect to receive for the security upon a current sale.

**Real estate:** Consists of both open-end and closed-end funds. There are no readily available market quotations for these real estate funds. These investments were measured at fair value using the NAV practical expedient.

**Other investments:** Consists of investments in a group insurance annuity contract and a limited partnership. Investments in the group insurance annuity contract were classified as Level 3 assets and measured at fair value by discounting the related cash flows based on current yields of similar instruments with comparable durations while considering the credit-worthiness of the issuer. The investments in the limited partnership were measured at fair value using the NAV practical expedient.

**Cash, other short-term investments and payables:** Consist primarily of cash and cash equivalents, and plan receivables/payables. The carrying amounts of cash and cash equivalents and receivables/payables approximate fair value due to the short-term nature of these instruments. Other payables and receivables consist primarily of margin on an account for a fund, accrued fees and receivables related to investment positions liquidated for which proceeds had not been received as of December 31.

On February 20, 2020, we entered into a commitment agreement ("the Agreement"), by and among AWI, Athene Annuity and Life Company ("AAIA"), Athene Annuity & Life Assurance Company of New York ("AANY") and State Street Global Advisors Trust Company ("State Street"), acting solely in its capacity as independent fiduciary of the RIP in connection with the transfer of pension obligations and administration to AAIA and AANY. Under the Agreement, the RIP will use RIP assets to purchase a single premium group annuity contract from each of AAIA and AANY. The annuity contracts will irrevocably transfer approximately \$1.0 billion of retiree defined benefit pension obligations related to approximately 10,000 retirees and beneficiaries ("the Transferred Participants") to AAIA and AANY, which will guarantee the pension benefits of the Transferred Participants.

Under the Agreement, each of AAIA and AANY is required to pay and administer the retirement benefits owed to the Transferred Participants covered by the applicable contract. The Agreement has no impact on the amount or timing of the monthly retirement benefit payments received by the Transferred Participants. We will not have to make any cash contributions to the RIP as a result of the Agreement.

The Agreement is subject to customary closing conditions for a transaction of this nature. Under the Agreement, all Transferred Participants will receive their first annuity payment from either AAIA or AANY on May 1, 2020.

As a result of the transaction, we expect to record a non-cash expense in the range of \$350 million and \$400 million in the first quarter of 2020 as a component of non-operating expense to reflect a partial plan settlement charge.

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After the transaction is complete, we anticipate the RIP will have projected benefit obligations of approximately \$370 million covering approximately 3,000 deferred vested and active participants. Benefits payable to participants who will remain in the RIP after the transaction are not being reduced as a result of the transaction.

The Agreement does not impact our benefit obligations under the RBEP.

U.S. DEFINED BENEFIT RETIREE HEALTH AND LIFE INSURANCE PLANS

We fund postretirement benefits on a pay-as-you-go basis, with the retiree paying a portion of the cost for health care benefits by means of deductibles and contributions.

The following tables summarize the balance sheet impact of the U.S. postretirement benefit pension plan, as well as the related benefit obligations, funded status and rate assumptions. We use a December 31 measurement date for all our defined benefit postretirement benefit plans.

	<u>2019</u>	<u>2018</u>
Change in benefit obligation:		
Benefit obligation as of beginning of period	\$ 65.4	\$ 86.6
Service cost	0.1	0.2
Interest cost	2.4	2.6
Plan participants' contributions	2.0	2.9
Plan amendments	(1.1)	-
Actuarial loss (gain)	18.1	(15.7)
Benefits paid	(9.4)	(11.2)
Benefit obligation as of end of period	<u>\$ 77.5</u>	<u>\$ 65.4</u>
	<u>2019</u>	<u>2018</u>
Change in plan assets:		
Fair value of plan assets as of beginning of period	\$ -	\$ -
Employer contributions	7.4	8.3
Plan participants' contributions	2.0	2.9
Benefits paid	(9.4)	(11.2)
Fair value of plan assets as of end of period	<u>\$ -</u>	<u>\$ -</u>
Funded status	<u>\$ (77.5)</u>	<u>\$ (65.4)</u>
	<u>2019</u>	<u>2018</u>
Weighted-average discount rate used to determine benefit obligations at end of period	3.14%	4.31%
Weighted-average discount rate used to determine net periodic benefit cost for the period	4.31%	3.60%

The components of postretirement benefit (credit) cost are as follows:

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Service cost of benefits earned during the period	\$ 0.1	\$ 0.2	\$ 0.4
Interest cost on accumulated postretirement benefit obligation	2.4	2.6	3.0
Amortization of prior service (credit)	(0.2)	(0.1)	-
Amortization of net actuarial gain	(8.5)	(5.7)	(3.6)
Net periodic postretirement benefit (credit)	<u>\$ (6.2)</u>	<u>\$ (3.0)</u>	<u>\$ (0.2)</u>

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For measurement purposes, an average rate of annual increase in the per capita cost of covered health care benefits of 7.2% for pre-65 retirees and 8.1% to 8.2% for post-65 retirees (depending on plan type) was assumed for 2019, decreasing ratably to an ultimate rate of 4.5% in 2026. Assumed health care cost trend rates can have a significant effect on the amounts reported for the health care plans. A one percentage point change in assumed health care cost trend rates would have the following effects:

	One percentage point	
	Increase	Decrease
Effect on total service and interest cost components	\$ -	\$ -
Effect on postretirement benefit obligation	0.1	(0.1)

Amounts recognized in assets (liabilities) on the consolidated balance sheets at year end consist of:

	U.S. Pension Plans		Non-U.S. Pension Plan		Retiree Health and Life Insurance Benefits	
	2019	2018	2019	2018	2019	2018
Prepaid pension costs	\$ 94.8	\$ 52.8	\$ -	\$ -	\$ -	\$ -
Accounts payable and accrued expenses	(3.9)	(4.3)	(0.1)	-	(6.5)	(6.6)
Postretirement benefit liabilities	-	-	-	-	(71.0)	(58.8)
Pension benefit liabilities	(43.9)	(47.8)	(2.7)	(2.5)	-	-
Net amount recognized	\$ 47.0	\$ 0.7	\$ (2.8)	\$ (2.5)	\$ (77.5)	\$ (65.4)

Pre-tax amounts recognized in accumulated other comprehensive (loss) income at year end consist of:

	U.S. Pension Plans		Retiree Health and Life Insurance Benefits	
	2019	2018	2019	2018
Net actuarial (loss) gain	\$ (540.7)	\$ (577.3)	\$ 32.8	\$ 59.3
Prior service (cost) credit	-	-	2.0	1.1
Accumulated other comprehensive (loss) income	\$ (540.7)	\$ (577.3)	\$ 34.8	\$ 60.4

For U.S. pension plans, we expect to amortize \$20.5 million of previously unrecognized net actuarial losses into pension cost in 2020 and expect to contribute \$3.9 million in 2020.

For our U.S. postretirement benefit plans, we expect to amortize \$5.9 million of previously unrecognized net actuarial gains and prior service credits into postretirement benefit cost in 2020 and expect to contribute \$6.5 million in 2020.

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid over the next ten years for our U.S. plans:

	U.S. Pension Benefits <sup>(1)</sup>	Retiree Health and Life Insurance Benefits, Net
	2020	\$ 103.6
2021	101.5	6.3
2022	100.5	6.2
2023	99.4	5.8
2024	97.8	5.6
2025 - 2029	450.7	24.2

<sup>(1)</sup> These payments exclude the impact of transferring retiree benefit obligations under the Agreement described above. We were not required and did not make contributions to the RIP during 2019, 2018 or 2017 as, based on guidelines established by the

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Pension Benefit Guaranty Corporation, the RIP had sufficient assets to fund its distribution obligations. Benefit payments to RIP participants have been made directly from the RIP while benefit payments under the RBEP are made from Company cash.

**NOTE 19. FINANCIAL INSTRUMENTS**

We do not hold or issue financial instruments for trading purposes. The estimated fair values of our financial instruments are as follows:

	December 31, 2019		December 31, 2018	
	Carrying amount	Estimated fair value	Carrying amount	Estimated fair value
Assets/(liabilities), net:				
Total long-term debt, including current portion	\$ (610.8)	\$ (610.8)	\$ (819.8)	\$ (811.3)
Interest rate swap contracts	(14.3)	(14.3)	3.5	3.5

The carrying amounts of cash and cash equivalents, receivables, accounts payable, and accrued expenses approximate fair value because of the short-term maturity of these instruments. The fair value estimates of long-term debt were primarily based on current market conditions. The fair value estimates for interest rate swap contracts are estimated by obtaining quotes from major financial institutions with verification by internal valuation models.

The fair value measurement of interest rate swap contracts measured at fair value on a recurring basis and reported on the Consolidated Balance Sheets were valued using Level 2 (other observable) inputs as of December 31, 2019 and 2018. We do not have any financial assets or liabilities that are valued using Level 1 (quoted, active market) or Level 3 (unobservable) inputs as of December 31, 2019 and 2018.

**NOTE 20. DERIVATIVE FINANCIAL INSTRUMENTS**

We are exposed to market risk from changes in foreign exchange rates, interest rates and commodity prices that could impact our results of operations, cash flows and financial condition. We use swaps to hedge interest rate exposures. At inception, interest rate swap derivatives that we designate as hedging instruments are formally documented as a hedge of a forecasted transaction or “cash flow” hedge. We also formally assess, both at inception and at least quarterly thereafter, whether the derivatives that are used in hedging transactions are highly effective in offsetting changes in the cash flows of the hedged item. If it is determined that a derivative ceases to be a highly effective hedge, or if the anticipated transaction is no longer probable of occurring, we discontinue hedge accounting and any future mark-to-market adjustments are recognized in earnings. We use derivative financial instruments as risk management tools and not for speculative trading purposes.

Counterparty Risk

We only enter into derivative transactions with established financial institution counterparties having an investment-grade credit rating. We monitor counterparty credit default swap levels and credit ratings on a regular basis. All of our derivative transactions with counterparties are governed by master International Swap and Derivatives Association agreements (“ISDAs”) with netting arrangements. These agreements can limit our exposure in situations where we have gain and loss positions outstanding with a single counterparty. We do not post nor do we receive cash collateral with any counterparty for our derivative transactions. These ISDAs do not have any credit contingent features; however, a default under our bank credit facility would trigger a default under these agreements. Exposure to individual counterparties is controlled and we consider the risk of counterparty default to be negligible.

Commodity Price Risk

We purchase natural gas and other various commodities for use in the manufacturing process. Although we are exposed to fluctuations in commodity pricing, we currently have no outstanding commodity derivative hedge positions.

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Currency Rate Risk – Sales and Purchases

As of December 31, 2019, our only major foreign currency exposure is to the Canadian dollar. We manage our Canadian cash flow exposures on a net basis. We currently have no outstanding positions and do not expect to enter into any foreign exchange derivative products.

Interest Rate Risk

We utilize interest rate swaps to minimize the fluctuations in earnings caused by interest rate volatility. These swaps are designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt. On November 28 2018, we entered into two swaps related to our Term Loan A: (1) a \$200.0 million notional swap where we receive a 1-month LIBOR and pay a fixed rate interest beginning in 2018 and running through 2023 and (2) a \$100.0 million notional forward starting swap, where we receive 1-month LIBOR and pay a fixed rate beginning in 2021 and running through 2025. As of December 31, 2018, these hedges were designated as cash flow hedges against changes in LIBOR for a portion of our existing and future variable rate debt. We recorded a \$4.6 million loss in other non-operating (income) expense during the fourth quarter of 2018, representing the change in fair value of these two swaps between the date these swaps were entered into and the date the swaps were designated as cash flow hedges.

The following table summarizes our interest rate swaps as of December 31, 2019:

Trade Date	Notional Amount	Coverage Period	Risk Coverage
November 13, 2016	\$ 200.0	November 2016 to March 2021	USD-LIBOR
November 28, 2018	\$ 200.0	November 2018 to November 2023	USD-LIBOR
November 28, 2018	\$ 100.0	March 2021 to March 2025	USD-LIBOR

Under the terms of the November 2016 swap maturing in 2021, we receive 3-month LIBOR and pay a fixed rate over the hedged period, in addition to a basis rate swap to convert the floating rate risk under our November 2016 swap from 3-month LIBOR to 1-month LIBOR. As a result, we receive 1-month LIBOR and pay a fixed rate over the hedged period.

Under the terms of the November 2018 swap maturing in 2023, we pay a fixed rate over the hedged amount and receive 1-month LIBOR. This is inclusive of a 0% floor.

Under the terms of the forward starting November 2018 swap maturing in 2025, we will pay a fixed rate monthly and receive 1-month LIBOR. This is inclusive of a 0% floor.

On September 30, 2019, in connection with the refinancing of our credit facility, we settled a \$100.0 million notional interest rate swap. See Note 17 for additional details related to our credit facility refinancing.

Financial Statement Impacts

The following tables detail amounts related to our derivatives as of December 31, 2019 and 2018. We did not have any derivative assets or liabilities not designated as hedging instruments for the years ended December 31, 2019 and 2018. The derivative asset and liability amounts below are shown in gross amounts; we have not netted assets with liabilities.

	Derivative Assets			Derivative Liabilities		
	Balance Sheet Location	Fair Value		Balance Sheet Location	Fair Value	
		December 31, 2019	December 31, 2018		December 31, 2019	December 31, 2018
Interest rate swap contracts	Other non-current assets	\$ 1.3	\$ 9.6	Other long-term liabilities	\$ 15.6	\$ 6.1

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	Amount of Gain (Loss) Recognized in AOCI			Location of Gain (Loss) Reclassified from AOCI into Income	Gain (Loss) Reclassified from AOCI into Income		
	2019	2018	2017		2019	2018	2017
<u>Derivatives in cash flow hedging relationships</u>							
Natural gas commodity contracts	\$ -	\$ 0.7	\$ (1.3)	Cost of goods sold	\$ -	\$ 0.1	\$ 0.3
Foreign exchange contracts – purchases	-	0.1	(0.5)	Cost of goods sold	-	-	-
Foreign exchange contracts – sales	-	0.7	(1.8)	Net sales	-	-	0.1
Interest rate swap contracts	(20.0)	(2.0)	2.2	Interest expense	(1.4)	(1.6)	(0.9)
				Total (loss) from continuing operations	\$ (1.4)	\$ (1.5)	\$ (0.5)
Total	<u>\$ (20.0)</u>	<u>\$ (0.5)</u>	<u>\$ (1.4)</u>	Total (loss) from discontinued operations	-	-	(0.1)
				Total (loss)	<u>\$ (1.4)</u>	<u>\$ (1.5)</u>	<u>\$ (0.6)</u>

As of December 31, 2019, the amount of existing losses in AOCI expected to be recognized in earnings over the next twelve months is \$2.6 million.

NOTE 21. OTHER LONG-TERM LIABILITIES

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Long-term deferred compensation arrangements	\$ 14.0	\$ 14.0
Environmental liabilities	1.5	11.7
Fair value of derivative liabilities	15.6	6.1
Other	6.7	6.2
Total other long-term liabilities	<u>\$ 37.8</u>	<u>\$ 38.0</u>

NOTE 22. SHARE-BASED COMPENSATION PLANS

The 2016 Long-Term Incentive Plan (“2016 LTIP”) authorizes us to issue stock options, stock appreciation rights, restricted stock awards, stock units, performance-based awards and cash awards to officers and key employees and expires on July 8, 2026, after which time no further awards may be made. The 2016 LTIP authorizes us to issue up to 8,949,000 shares of common stock, which includes all shares that have been issued under the 2016 LTIP. As of December 31, 2019, 3,456,997 shares were available for future grants under the 2016 LTIP, excluding any future adjustments to shares for performance-based awards that have been previously granted.

The 2016 Directors Stock Unit Plan (“2016 Director’s Plan”) authorizes us to issue stock units to non-employee directors until July 2026. The 2016 Director’s Plan authorizes us to issue up to 550,000 shares of common stock, which includes all shares that have been issued under the 2016 Director’s Plan. As of December 31, 2019, 179,496 shares were available for future grants under the 2016 Director’s Plan.

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The following table presents stock option activity for the year ended December 31, 2019:

	Number of shares (thousands)	Weighted- average exercise price	Weighted- average remaining contractual term (years)	Aggregate intrinsic value (millions)
Option shares outstanding, December 31, 2018	602.5	\$ 41.71		
Option shares exercised	(341.4)	42.38		
Option shares outstanding, December 31, 2019	261.1	\$ 40.84	2.6	\$ 13.9
Option shares exercisable, vested and expected to vest, December 31, 2019	261.1	\$ 40.84	2.6	\$ 13.9

We have reserved sufficient authorized shares to allow us to issue new shares upon exercise of all outstanding options. Options generally become exercisable in three years and expire 10 years from the date of grant. When options are exercised, we may issue new shares, use treasury shares (if available), acquire shares held by investors, or a combination of these alternatives in order to satisfy the option exercises.

The following table presents information related to stock option exercises:

	2019	2018	2017
Total intrinsic value of stock options exercised	\$ 15.9	\$ 23.7	\$ 0.9
Cash proceeds received from stock options exercised	\$ 14.5	\$ 18.4	\$ 3.3
Tax deduction (expense) realized from stock options exercised	\$ 3.3	\$ 6.1	\$ (0.2)

The fair value of option grants was estimated on the date of grant using the Black-Scholes option pricing model. There have been no option grants since 2014.

We also grant non-vested stock awards in the form of Restricted Stock Units (“RSUs”) and Performance Stock Units (“PSUs”). A summary of the 2019 activity related to the RSUs and PSUs is as follows:

	Non-Vested Stock Awards			
	RSUs		PSUs	
	Number of shares (thousands)	Weighted- average fair value at grant date	Number of shares (thousands)	Weighted- average fair value at grant date
December 31, 2018	100.3	\$ 48.69	503.2	\$ 45.14
Granted	34.9	82.99	118.6	76.05
Performance adjustments	-	-	273.8	38.66
Vested	(62.0)	(46.32)	(513.8)	(38.89)
Forfeited	(7.8)	(64.18)	(24.1)	(63.48)
December 31, 2019	65.4	\$ 66.49	357.7	\$ 58.27

RSUs entitle the recipient to a specified number of shares of AWI’s common stock provided the prescribed service period is fulfilled. PSUs entitle the recipient to a specified number of shares of AWI’s common stock provided the defined financial targets are achieved at the end of the performance period. Upon vesting, final adjustments based upon financial achievements are reflected as performance adjustments in the table above. RSUs and PSUs generally had vesting periods of three years at the grant date. RSUs and PSUs earn dividends during the vesting period that are forfeitable if the awards do not vest.

The table above contains 5,680 RSUs as of December 31, 2018 which were accounted for as liability awards as they were able to be settled in cash. There are no outstanding RSUs accounted for as liability awards as of December 31, 2019. There were 895 and 1,742 PSUs as of December 31, 2019 and 2018, respectively, which are accounted for as liability awards as they are able to be settled in cash. Employee liability awards outstanding for all periods represent awards to certain employees of our former EMEA and Pacific Rim businesses, which vest when the appropriate performance period ends.



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RSUs and PSUs with non-market based performance conditions are measured at fair value based on the closing price of our stock on the date of grant. In 2019 and 2018, we granted 58,430 and 69,669 PSUs, respectively, with market-based performance conditions that are valued through the use of a Monte Carlo simulation. The weighted average assumptions for PSUs measured at fair value through the use of a Monte Carlo simulation are presented in the table below.

	2019	2018
Weighted-average grant date fair value of market-based PSUs granted (dollars per award)	\$ 77.80	\$ 53.01
<u>Assumptions</u>		
Risk-free rate of return	2.4%	2.4%
Expected volatility	25.9%	26.3%
Expected term (in years)	3.1	3.1
Expected dividend yield	0.0%	0.0%

The risk-free rate of return was determined based on the implied yield available on zero coupon U.S. Treasury bills at the time of grant with a remaining term equal to the expected term of the PSUs. The expected volatility was based on an average of the actual historical volatilities of the stock prices of AWI and a peer group of companies. We elected to not rely solely on AWI's actual historical stock price volatility due to the separation of AFI in 2016. The expected term represented the performance period on the underlying award. The expected dividend yield was assumed to be zero under the assumption that dividends distributed during the performance period are reinvested in AWI's common stock.

In addition to the equity awards described above, as of December 31, 2019 we had 11,773 fully-vested phantom shares outstanding for non-employee directors under the 2006 Phantom Stock Unit Plan not reflected in the non-vested stock awards table above. These awards are settled in cash and had vesting periods of one to three years. The awards are generally payable six months following the director's separation from service on the Board of Directors. The total liability recorded for these shares as of December 31, 2019 was \$1.0 million which includes associated non-forfeitable dividends. The 2006 Phantom Stock Unit Plan is still in place; however, no additional shares will be granted under the plan.

As of December 31, 2019 and 2018, there were 140,417 and 163,564 RSUs, respectively, outstanding under the 2016 Directors Stock Unit Plan not reflected in the non-vested stock awards table above. In 2019 and 2018, we granted 9,981 and 13,058 restricted stock units, respectively, to non-employee directors. These awards generally have a vesting period of one year, and as of December 31, 2019 and 2018, 130,436 and 150,506 shares, respectively, were vested but not yet delivered. The awards are generally payable upon vesting or the director's deferral election. These awards earn dividends during the vesting period that are non-forfeitable.

We recognize share-based compensation expense on a straight-line basis over the vesting period. Share-based compensation cost was \$8.4 million (\$6.3 million net of tax benefit) in 2019, \$12.9 million (\$9.6 million net of tax benefit) in 2018, and \$9.8 million (\$5.9 million net of tax benefit) in 2017.

As of December 31, 2019, there was \$12.5 million of total unrecognized compensation cost related to non-vested share-based compensation arrangements. That cost is expected to be recognized over a weighted-average period of 1.8 years.

NOTE 23. EMPLOYEE COSTS

	2019	2018	2017
Wages, salaries and incentive compensation	\$ 201.8	\$ 197.2	\$ 191.0
Payroll taxes	16.0	15.6	14.2
Defined contribution and defined benefit pension plan (credit) expense, net	2.0	(17.8)	4.1
Insurance and other benefit costs	21.9	22.3	24.0
Share-based compensation	8.4	12.9	9.8
Total	<u>\$ 250.1</u>	<u>\$ 230.2</u>	<u>\$ 243.1</u>

As a result of our adoption of ASU 2017-07, defined contribution and defined benefit pension plan expense, net, included above includes non-service cost components of net periodic pension costs that are reflected as a component of other non-operating income on the Consolidated Statements of Earnings and Comprehensive Income for all years presented. See Note 18 for details related to our components of net periodic pension costs.

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NOTE 24. SHAREHOLDERS' EQUITY

Common Stock Repurchase Plan

On July 29, 2016, we announced that our Board of Directors had approved a share repurchase program pursuant to which we were authorized to repurchase up to \$150.0 million of our outstanding shares of common stock through July 31, 2018 (the "Program"). On October 30, 2017, we announced that our Board of Directors had approved an additional \$250.0 million authorization to repurchase shares under the Program. The Program was also extended through October 31, 2020. On July 31, 2018, we announced that our Board of Directors had approved an additional \$300.0 million authorization to repurchase shares, increasing the total authorized amount under the Program to \$700.0 million, excluding commissions.

Repurchases under the Program may be made through open market, block and privately-negotiated transactions, including Rule 10b5-1 plans, at such times and in such amounts as management deems appropriate, subject to market and business conditions, regulatory requirements and other factors. The Program does not obligate AWI to repurchase any particular amount of common stock and may be suspended or discontinued at any time without notice.

On August 2, 2018, we entered into an accelerated share repurchase ("ASR") agreement with Deutsche Bank AG under the Program. The ASR included a pre-payment of \$150.0 million to Deutsche Bank AG, at which time we received 1,766,004 shares. The ASR terminated on October 8, 2018, with an additional 389,825 shares returned on that day to complete the ASR.

During 2019, we repurchased 1.5 million shares under the Program for a total cost of \$131.2 million, excluding commissions, or an average price of \$86.02 per share. Since inception, including the ASR, we have repurchased 9.2 million shares under the Program for a total cost of \$561.8 million, excluding commissions, or an average price of \$60.98 per share.

Dividends

In February, April and July 2019, our Board of Directors declared \$0.175 per share quarterly dividends, which were paid to shareholders in March, May and August 2019, respectively. In October 2019, our Board of Directors declared a \$0.20 per share quarterly dividend, which was paid to shareholders in November 2019. On February 19, 2020, our Board of Directors declared a \$0.20 per share quarterly dividend to be paid in March 2020.

Accumulated Other Comprehensive (Loss)

The balance of each component of accumulated other comprehensive (loss), net of tax is presented in the table below.

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Foreign currency translation adjustments	\$ 9.4	\$ (74.7)
Derivative (loss) gain, net	(8.5)	5.3
Pension and postretirement adjustments	(377.0)	(390.2)
Accumulated other comprehensive (loss)	<u>\$ (376.1)</u>	<u>\$ (459.6)</u>

The amounts and related tax effects allocated to each component of other comprehensive income for 2019, 2018, and 2017 are presented in the tables below.

	<u>Pre-tax Amount</u>	<u>Tax (Expense) Benefit</u>	<u>After-tax Amount</u>
<u>2019</u>			
Foreign currency translation adjustments	\$ 84.1	\$ -	\$ 84.1
Derivative (loss) gain, net	(18.8)	4.9	(13.9)
Pension and postretirement adjustments	16.8	(3.6)	13.2
Total other comprehensive (loss)	<u>\$ 82.1</u>	<u>\$ 1.3</u>	<u>\$ 83.4</u>

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	<u>Pre-tax Amount</u>	<u>Tax Benefit</u>	<u>After-tax Amount</u>
<u>2018</u>			
Foreign currency translation adjustments	\$ (27.6)	\$ -	\$ (27.6)
Derivative gain, net	0.9	0.2	1.1
Pension and postretirement adjustments	(41.6)	8.7	(32.9)
Total other comprehensive (loss)	<u>\$ (68.3)</u>	<u>\$ 8.9</u>	<u>\$ (59.4)</u>
	<u>Pre-tax Amount</u>	<u>Tax (Expense) Benefit</u>	<u>After-tax Amount</u>
<u>2017</u>			
Foreign currency translation adjustments	\$ 24.5	\$ -	\$ 24.5
Derivative (loss) gain, net	(0.8)	0.5	(0.3)
Pension and postretirement adjustments	50.4	(16.7)	33.7
Total other comprehensive income	<u>\$ 74.1</u>	<u>\$ (16.2)</u>	<u>\$ 57.9</u>

The following table summarizes the activity, by component, related to the change in AOCI for December 31, 2019 and 2018:

	<u>Foreign Currency Translation Adjustments</u>	<u>Derivative Gain (Loss) <sup>(1)</sup></u>	<u>Pension and Postretirement Adjustments <sup>(1)</sup></u>	<u>Total Accumulated Other Comprehensive (Loss) <sup>(1)</sup></u>
Balance, December 31, 2017	\$ (47.1)	\$ 3.5	\$ (302.3)	\$ (345.9)
Impact of ASU 2018-02 adoption	-	0.7	(55.0)	(54.3)
Other comprehensive (loss) before reclassifications, net of tax benefit of \$ -, \$0.6, \$11.3 and \$11.9	(27.6)	-	(44.7)	(72.3)
Amounts reclassified from accumulated other comprehensive (loss)	-	1.1	11.8	12.9
Net current period other comprehensive (loss) income	<u>(27.6)</u>	<u>1.1</u>	<u>(32.9)</u>	<u>(59.4)</u>
Balance, December 31, 2018	(74.7)	5.3	(390.2)	(459.6)
Impact of ASU 2017-12 adoption	-	0.1	-	0.1
Other comprehensive income (loss) before reclassifications, net of tax benefit (expense) of \$ -, \$5.2, (\$1.4) and \$3.8	3.9	(15.0)	1.4	(9.7)
Amounts reclassified from accumulated other comprehensive (loss)	80.2	1.1	11.8	93.1
Net current period other comprehensive income (loss)	<u>84.1</u>	<u>(13.9)</u>	<u>13.2</u>	<u>83.4</u>
Balance, December 31, 2019	<u>\$ 9.4</u>	<u>\$ (8.5)</u>	<u>\$ (377.0)</u>	<u>\$ (376.1)</u>

(1) Amounts are net of tax

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The amounts reclassified from AOCI and the affected line item of the Consolidated Statement of Earnings and Comprehensive Income are presented in the table below.

	Amounts Reclassified from Accumulated Other Comprehensive (Loss)		Affected Line Item in the Condensed Consolidated Statement of Earnings and Comprehensive Income
	2019	2018	
<b>Derivative Adjustments:</b>			
Natural gas commodity contracts	\$ -	\$ (0.1)	Cost of goods sold
Foreign exchange contracts - purchases	-	-	Cost of goods sold
Foreign exchange contracts - sales	-	-	Net sales
Interest rate swap contracts	1.4	1.6	Interest expense
Total loss, before tax	1.4	1.5	
Tax impact	(0.3)	(0.4)	Income tax expense
Total loss, net of tax	1.1	1.1	
<b>Pension and Postretirement Adjustments:</b>			
Prior service cost amortization	(0.2)	(0.1)	Other non-operating (income), net
Amortization of net actuarial loss	10.7	14.4	Other non-operating (income), net
Total expense, before tax	10.5	14.3	
Tax impact	(2.2)	(3.0)	Income tax expense
Total expense from continuing operations, net of tax	8.3	11.3	
Total expense from discontinued operations, net of tax expense of \$- and \$-	-	0.5	
Adjustments related to Sale to Knauf <sup>(1)</sup>	3.5	-	
Total expense, net of tax	11.8	11.8	
Foreign currency translation adjustments related to Sale to Knauf <sup>(1)</sup>	80.2	-	
Total reclassifications for the period	\$ 93.1	\$ 12.9	

(1) Represents amounts reclassified out of Accumulated other comprehensive loss during 2019 related to the Sale and included as a component of (Loss) gain from disposal of discontinued operations on the Consolidated Statements of Earnings and Comprehensive Income. A portion of these amounts were included in our previously reported estimated loss on sale. See Note 6 for additional details.

**NOTE 25. SUPPLEMENTAL FINANCIAL INFORMATION**

	2019	2018	2017
<b>Selected operating expense</b>			
Maintenance and repair costs	\$ 41.4	\$ 41.6	\$ 42.5
Research and development costs	14.8	16.3	17.4
Advertising costs	7.0	6.5	6.0
<b>Other non-operating (income)/expense</b>			
Interest income	\$ (3.2)	\$ (4.3)	\$ (1.8)
Pension and postretirement benefit (credits)	(16.9)	(33.0)	(11.3)
Other	(0.3)	4.8	(0.6)
Total	\$ (20.4)	\$ (32.5)	\$ (13.7)

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NOTE 26. RELATED PARTIES

In some geographies and for some customers, we purchase grid products from WAVE, our 50%-owned joint venture with Worthington Industries, for resale to customers. The total amount of these purchases was \$22.5 million in 2019, \$22.5 million in 2018 and \$18.2 million in 2017. We also provide certain selling, promotional and administrative processing services to WAVE for which we receive reimbursement. Those services amounted to \$15.7 million in 2019, \$15.8 million in 2018, and \$14.9 million in 2017. The net amount due to WAVE from us for all of our relationships was \$3.3 million as of December 31, 2019 and \$3.0 million as of December 31, 2018. As of December 31, 2019 and 2018, we also recorded \$25.9 million and \$22.4 million, respectively, payable to WAVE for their remaining portion of the proceeds from the Sale, which is reflected within Accounts payable and accrued expenses in the Consolidated Balance Sheets. See Note 11 to the Consolidated Financial Statements for additional information.

NOTE 27. LITIGATION AND RELATED MATTERS

ENVIRONMENTAL MATTERS

Environmental Compliance

Our manufacturing and research facilities are affected by various federal, state and local requirements relating to the discharge of materials and the protection of the environment. We make expenditures necessary for compliance with applicable environmental requirements at each of our operating facilities. While these expenditures are not typically material, the applicable regulatory requirements continually change and, as a result, we cannot predict with certainty the amount, nature or timing of future expenditures associated with environmental compliance.

Environmental Sites

Summary

We are actively involved in the investigation, closure and/or remediation of existing or potential environmental contamination under the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”) and state Superfund and similar environmental laws at three domestically owned locations allegedly resulting from past industrial activity.

In each location, we are one of multiple potentially responsible parties and have agreed to jointly fund the required investigation and remediation, while preserving our defenses to the liability. We may also have rights of contribution or reimbursement from other parties or coverage under applicable insurance policies. We are currently pursuing coverage and recoveries under those policies with respect to certain of the sites, including the Macon, GA site and the Elizabeth City, NC site, each of which is summarized below. These efforts have included two active and independent litigation matters against legacy primary and excess policy insurance carriers for recovery of fees and costs incurred by us in connection with our investigation and remediation activities for such sites. As described below, the litigation matter in Oregon relating to the St. Helens, OR site was dismissed in the second quarter of 2019 in connection with our settlement with the State of Oregon. Other than disclosed below, we are unable to predict the outcome of these matters or the timing of any recoveries, whether through settlement or otherwise. We are also unable to predict the extent to which any recoveries might cover our final share of investigation and remediation costs for these sites. Our final share of investigation and remediation costs may exceed any such recoveries, and such amounts net of insurance recoveries may be material.

In 2017 and 2018, we entered settlement agreements totaling \$37.5 million with certain legacy insurance carriers to resolve ongoing litigation and recover fees and costs previously incurred by us in connection with certain environmental sites. These settlements were recorded as a \$9.2 million reduction to cost of goods sold and a \$28.3 million reduction to SG&A expenses reflecting the same income statement categories where environmental expenditures were historically recorded. All of these cash settlements have been released to us from escrow, including \$6.5 million received in 2019. In 2019, we entered into two new settlement agreements totaling \$1.9 million and received an additional \$0.4 million in payments related to a previous settlement. These settlements were recorded as a \$2.3 million reduction to SG&A expenses. We anticipate that we may enter into additional settlement agreements in the future, which may or may not be material, with other legacy insurers to obtain reimbursement or contribution for environmental site expenses.

Estimates of our future liability at the environmental sites are based on evaluations of currently available facts regarding each individual site. We consider factors such as our activities associated with the site, existing technology, presently enacted laws and regulations and prior company experience in remediating contaminated sites. Although current law imposes joint and several liability on all parties at Superfund sites, our contribution to the remediation of these sites is expected to be limited by the number of other companies potentially liable for site remediation. As a result, our estimated liability reflects only our expected share. In determining the probability of contribution, we consider the solvency of other parties, the site activities of other parties, whether liability is being

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disputed, the terms of any existing agreements and experience with similar matters, and the effect of our October 2006 Chapter 11 reorganization upon the validity of the claim, if any.

Specific Material Events

St Helens, OR

In August 2010, we entered into a Consent Order (the “Consent Order”) with the Oregon Department of Environmental Quality (“ODEQ”), along with Kaiser Gypsum Company, Inc. (“Kaiser”), and Owens Corning Sales LLC (“OC”), with respect to our St. Helens, Oregon facility, which was previously owned by Kaiser and then OC.

Through voluntary mediation in November 2017 with ODEQ, OC and Kaiser, we reached settlement with ODEQ; in exchange for a release from ODEQ for all contamination claims against us, we would pay \$8.6 million to the State of Oregon and perform a previously scoped remedial action for the upland area. We submitted the settlement payment to ODEQ and completed the remedial action for the upland area in 2019.

On November 26, 2018, Kaiser filed a complaint against AWI seeking monetary damages and declaratory relief including cost recovery and/or contributions from AWI in connection with the environmental costs incurred by Kaiser at St. Helens. On March 1, 2019, we entered into a \$1.0 settlement agreement with Kaiser resolving all claims between us, which was paid during the second quarter of 2019.

ODEQ has approved a Construction Completion and Final Closeout Report for the Upland area and issued a Conditional No Further Action Determination, including the Easement and Equitable Servitude, which was recorded in Columbia County, Oregon. As a result of the settlements with ODEQ and Kaiser, and these actions by ODEQ, we do not expect to incur any future material costs relating to this matter.

Macon, GA

The U.S. Environmental Protection Agency (the “EPA”) has listed two landfills located on a portion of our facility in Macon, GA, along with the former Macon Naval Ordnance Plant landfill adjacent to our property, portions of Rocky Creek, and certain tributaries leading to Rocky Creek (collectively, the “Macon Site”) as a Superfund site on the National Priorities List due to the presence of contaminants, most notably polychlorinated biphenyls (“PCBs”).

In September 2010, we entered into an Administrative Order on Consent for a Removal Action (the “Removal Action”) with the EPA to investigate PCB contamination in one of the landfills on our property, the Wastewater Treatment Plant Landfill (the “WWTP Landfill,” also known as “Operable Unit 1”). After completing an investigation of the WWTP Landfill and submitting our final Engineering Evaluation/Cost Analysis, the EPA issued an Action Memorandum in July 2013 selecting our recommended remedy for the Removal Action. The Operable Unit 1 response action for the WWTP Landfill is complete and the final report was submitted to the EPA on October 11, 2016. The EPA approved the final report on November 28, 2016, and a Post-Removal Control Plan (the “Plan”) was submitted to the EPA on March 28, 2017. That Plan will monitor the effectiveness of the WWTP Landfill response action over a five-year period and our estimate of future liabilities includes these tasks.

It is probable that we will incur field investigation, engineering and oversight costs associated with a remedial investigation and feasibility study (“RI/FS”) with respect to the remainder of the Superfund site, which includes the other landfill on our property, as well as areas on and adjacent to our property and Rocky Creek (the “Remaining Site,” also known as “Operable Unit 2”). On September 25, 2015, AWI and other Potential Responsible Parties (“PRPs”) received a Special Notice Letter from the EPA under CERCLA inviting AWI and the PRPs to enter into the negotiation of an agreement to conduct an RI/FS of Operable Unit 2. We and the other PRPs entered into a settlement agreement with the EPA effective September 18, 2018, in response to the Special Notice Letter to conduct the RI/FS. The PRPs submitted a complete RI/FS work plan in the second quarter of 2019, which the EPA approved on September 11, 2019. Investigative work on this portion of the site commenced in December 2019 and we anticipate that the EPA will require significant investigative work for Operable Unit 2. We may ultimately incur costs in remediating any contamination discovered during the RI/FS. The current estimate of future liability at this site includes only our estimated share of the costs of the investigative work that, at this time, we anticipate the EPA will require the PRPs to perform. We are unable to reasonably estimate our final share of the total costs associated with the investigation work or any resulting remediation therefrom, although such amounts may be material to any one quarter's or year's results of operations in the future. However, we do not expect the total future costs to have a material adverse effect on our liquidity or financial condition as the cash payments may be made over many years.

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Elizabeth City, NC

This site is a former cabinet manufacturing facility that was operated by Triangle Pacific Corporation, now known as Armstrong Wood Products, Inc. (“Triangle Pacific” or “AWP”), from 1977 until 1996. The site was formerly owned by the U.S. Navy (“Navy”) and Westinghouse, now CBS Corporation (“CBS”). We assumed ownership of the site when we acquired the stock of Triangle Pacific in 1998. Prior to our acquisition, the NC Department of Environment and Natural Resources listed the site as a hazardous waste site. In 1997, Triangle Pacific entered into a cost sharing agreement with Westinghouse whereby the parties agreed to share equally in costs associated with investigation and potential remediation. In 2000, Triangle Pacific and CBS entered into an Administrative Order on Consent to conduct an RI/FS with the EPA for the site. In 2007, we and CBS entered into an agreement with the Navy whereby the Navy agreed to pay one third of defined past and future investigative costs up to a certain amount, which has now been exhausted. The EPA approved the RI/FS work plan in August 2011. In January 2014, we submitted the draft Remedial Investigation and Risk Assessment reports and conducted supplemental investigative work based upon agency comments to those reports. In connection with the separation of AFI in 2016, we agreed to retain any legacy environmental liabilities associated with the AWP site. The EPA published an Interim Action Proposed Plan for the site in April 2018 seeking public comment through June 7, 2018. The EPA has evaluated comments, including ours, and has published its Interim Record Of Decision selecting an interim cleanup approach. On September 25, 2018, AWI and CBS received a Special Notice Letter from the EPA under CERCLA inviting AWI and CBS to enter into the negotiation of a settlement agreement to conduct or finance the response action at the site. During the third quarter of 2018, we increased our reserve for the cost of the interim cleanup, which we expect to be shared with CBS and the Navy. In response to the September 2018 Special Notice Letter, AWI and CBS submitted a good faith offer to EPA on May 28, 2019. The current estimate of future liability at this site includes only our estimated share of the costs of the interim remedial action that, at this time, we anticipate the EPA will require the PRPs to perform. We are unable to reasonably estimate our final share of the total costs associated with the final remediation or any resulting remediation therefrom, although such amounts may be material to any one quarter's or year's results of operations in the future. However, we do not expect the total future costs to have a material adverse effect on our liquidity or financial condition as the cash payments may be made over many years.

Summary of Financial Position

Total liabilities of \$1.6 million as of December 31, 2019 and \$12.4 million as of December 31, 2018 were recorded for environmental liabilities that we consider probable and for which a reasonable estimate of the probable liability could be made. As of December 31, 2019 and 2018, \$0.1 million and \$0.7 million, respectively, were reflected within Accounts payable and accrued expenses with respect to environmental liabilities. During 2019, we recorded \$1.0 million of additional reserves for potential environmental liabilities. During 2018, we recorded reserves for potential environmental liabilities of \$0.5 million. Where existing data is sufficient to estimate the liability, that estimate has been used; where only a range of probable liabilities is available and no amount within that range is more likely than any other, the lower end of the range has been used. As assessments and remediation activities progress at each site, these liabilities are reviewed to reflect new information as it becomes available and adjusted to reflect amounts actually incurred and paid. These liabilities are undiscounted

The estimated liabilities above do not take into account any claims for recoveries from insurance or third parties. It is our policy to record insurance recoveries as assets in the Consolidated Balance Sheets when probable. For insurance recoveries that are reimbursements of prior environmental expenditures, the income statement impact is recorded within cost of goods sold and SG&A expenses, which are the same income statement categories within which environmental expenditures were historically recorded. Insurance recoveries in excess of historical environmental spending are recorded on the balance sheet as a part of other long-term liabilities and released as future environmental spending occurs or the liability is settled.

Actual costs to be incurred at identified sites may vary from our estimates. Based on our knowledge of the identified sites, it is not possible to reasonably estimate future costs in excess of amounts already recognized.

OTHER CLAIMS

On September 8, 2017, Roxul USA, Inc. (d/b/a Rockfon) (“Rockfon”) filed litigation against us in the United States District Court for the District of Delaware (the “Court”) alleging anticompetitive conduct seeking remedial measures and unspecified damages. Roxul USA, Inc. is a significant ceilings systems competitor with global headquarters in Europe and expanding operations in the Americas. On April 3, 2019, we entered into a confidential settlement agreement with Rockfon to fully resolve the litigation between us, and Rockfon filed a Stipulation of Dismissal with Prejudice (“Dismissal”) with the Court. Pursuant to the Dismissal, Rockfon formally dismissed all claims it had against AWI with prejudice. All claims in the litigation have been fully and finally dismissed and released with AWI making a payment to Rockfon for its costs, expenses and attorneys’ fees. Pursuant to the settlement, both parties acknowledged that (a) AWI denies all claims of wrongdoing and makes no admission of wrongdoing or of the truth of any of the

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claims or allegations contained in Rockfon’s complaint or otherwise alleged in the litigation; (b) all AWI exclusive distribution locations (i.e., any location where a reseller has agreed to sell only AWI ceiling system products) will remain exclusive to AWI under their respective distribution agreements, and (c) in all other non-exclusive or “open” distribution locations, resellers are free to purchase and resell ceiling systems products of any manufacturer at their discretion. During 2019, we incurred \$19.7 million of expenses in connection with the matter, primarily relating to legal and professional fees incurred by us in connection with the litigation, including expenses and attorney’s fees paid under the settlement agreement. As a result of the settlement and Dismissal, we do not expect to incur additional future costs or expenses relating to the matter.

We are involved in other various lawsuits, claims, investigations and other legal matters from time to time that arise in the ordinary course of business, including matters involving our products, intellectual property, relationships with suppliers, relationships with distributors, relationships with competitors, employees and other matters. From time to time, for example, we may be a party to litigation matters that involve product liability, tort liability and other claims under various allegations, including illness due to exposure to certain chemicals used in the workplace; or medical conditions arising from exposure to product ingredients or the presence of trace contaminants. Such allegations may involve multiple defendants and relate to legacy products that we and other defendants purportedly manufactured or sold. We believe that any current claims are without merit and intend to defend them vigorously. For these matters, we also may have rights of contribution or reimbursement from other parties or coverage under applicable insurance policies. When applicable and appropriate, we will pursue coverage and recoveries under those policies, but are unable to predict the outcome of those demands. While complete assurance cannot be given to the outcome of these proceedings, we do not believe that any current claims, individually or in the aggregate, will have a material adverse effect on our financial condition, liquidity or results of operations.

NOTE 28. EARNINGS PER SHARE

Earnings per share components may not add due to rounding.

The following table is a reconciliation of net earnings to net earnings attributable to common shares used in our basic and diluted EPS calculations for the years ended December 31, 2019, 2018 and 2017:

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Earnings from continuing operations	\$ 242.3	\$ 189.6	\$ 220.6
Earnings allocated to participating non-vested share awards	(0.5)	(0.6)	(0.7)
Earnings from continuing operations attributable to common shares	<u>\$ 241.8</u>	<u>\$ 189.0</u>	<u>\$ 219.9</u>
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Basic shares outstanding	48.7	51.3	53.3
Dilutive effect of common stock equivalents	0.8	0.8	0.6
Diluted shares outstanding	<u>49.5</u>	<u>52.1</u>	<u>53.9</u>

Anti-dilutive options excluded from the computation of dilutive EPS for 2019 were 7,580. There were no anti-dilutive stock options excluded from the computation of diluted EPS in 2018. Anti-dilutive options excluded from the computation of dilutive EPS for 2017 were 319,836.



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

Not applicable.

**ITEM 9A. CONTROLS AND PROCEDURES**

Our management, with the participation of our chief executive officer and our chief financial officer, performed an evaluation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934 (“Exchange Act”)) as of December 31, 2019. Our chief executive officer and our chief financial officer have concluded that our disclosure controls and procedures were effective insofar as they are designed to provide reasonable assurance that information required to be disclosed by us in the reports we file or submit under the Exchange Act is (i) recorded, processed, summarized and reported, within the time periods specified in the Commission’s rules and forms, and (ii) accumulated and communicated to our management, including our principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. We believe that a controls system, no matter how well designed and operated, cannot provide absolute assurance that the objectives of the controls system are met, and no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within a company have been detected.

There have been no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2019 that have materially affected or are reasonably likely to materially affect our internal control over financial reporting.

Management’s Report on Internal Control over Financial Reporting and the Report of Independent Registered Public Accounting Firm are incorporated by reference to Item 8 to this Annual Report on Form 10-K.

**ITEM 9B. OTHER INFORMATION**

Not applicable.

## PART III

### **ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE**

#### **Information about our Executive Officers (as of February 25, 2020):**

<b><u>Name</u></b>	<b><u>Age</u></b>	<b><u>Present Position and Business Experience During the Last Five Years*</u></b>
Victor D. Grizzle	58	Armstrong World Industries, Inc. President & CEO, Director since April 2016 Executive Vice President & CEO, Armstrong Building Products (2011 to April 2016)
Charles M. Chiappone	57	Armstrong World Industries, Inc. Senior Vice President, Ceiling and Wall Solutions since April 2018 Senior Vice President, Ceiling Solutions (April 2016 to April 2018) Vice President of Global Marketing & Commercial Excellence, Armstrong Building Products (January 2012 to April 2016)
Mark A. Hershey	50	Armstrong World Industries, Inc. Senior Vice President, General Counsel and Business Development since January 2020 Senior Vice President, General Counsel since July 2011 Chief Compliance Officer since February 2012 Secretary (July 2011 to June 2014 and since April 2016)
Brian L. MacNeal	53	Armstrong World Industries, Inc. Senior Vice President, Chief Financial Officer since April 2016 Vice President, Global Finance and CFO, Armstrong Building Products (2014 to April 2016) Heartland Energy Solutions Interim Chief Financial Officer (2013 to 2014) Campbell Soup Company Vice President of Finance (2011 to 2013)
Stephen F. McNamara	53	Armstrong World Industries, Inc. Vice President, Controller since July 2008
Ellen R. Romano	58	Armstrong World Industries, Inc. Senior Vice President, Human Resources since July 2013 Vice President, Human Resources, Armstrong Building Products (2009 to 2013)

\* *Information in parentheses regarding previously held positions indicates either the duration the Executive Officer held the position or the year in which service in the position began.*

All executive officers are elected by the Board of Directors to serve in their respective capacities until their successors are elected and qualified or until their earlier resignation or removal.

#### **Code of Ethics**

We have adopted a Code of Business Conduct that applies to all employees, executives and directors, specifically including our Chief Executive Officer, our Chief Financial Officer and our Controller. We have also adopted a Code of Ethics for Financial Professionals (together with the Code of Business Conduct, the “Codes of Ethics”) that applies to all professionals in our finance and accounting functions worldwide, including our Chief Financial Officer and our Controller.

The Codes of Ethics are intended to deter wrongdoing and to promote:

- honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships;
- full, fair, accurate, timely and understandable public disclosures;
- compliance with applicable governmental laws, rules and regulations;

- the prompt internal reporting of violations of the Codes of Ethics; and
- accountability for compliance with the Codes of Ethics.

The Codes of Ethics are available at <http://www.armstrongceilings.com/corporate/codes-policies.html> and in print free of charge. Any waiver of the Company's Code of Business Conduct, particularly its conflicts-of-interest provisions, which may be proposed to apply to any director or executive officer, must be reviewed in advance by the Nominating and Governance Committee of the Board of Directors, which would be responsible for making a recommendation to the Board of Directors for approval or disapproval. The Board of Directors' decision on any such matter would be disclosed publicly in compliance with applicable legal standards and the rules of the New York Stock Exchange. We intend to satisfy these requirements by making disclosures concerning such matters available on the "For Investors" page of our website. There were no waivers or exemptions from the Code of Business Conduct in 2019 applicable to any director or executive officer.

Other information required by Item 10 is incorporated by reference to the sections entitled "Election of Directors," "Corporate Governance," and "Section 16(a) Beneficial Ownership Reporting Compliance" in the Company's proxy statement for its 2020 annual meeting of shareholders to be filed no later than April 29, 2020.

#### **ITEM 11. EXECUTIVE COMPENSATION**

The information required by Item 11 is incorporated by reference to the sections entitled "Compensation Discussion and Analysis," "Compensation Committee Report," "Summary Compensation Table," "Grants of Plan-Based Awards," "Outstanding Equity Awards at Fiscal Year-End," "Option Exercises and Stock Vested," "Pension Benefits," "Nonqualified Deferred Compensation," "Potential Payments Upon Termination or Change in Control," "Board of Directors – Board's Role in Risk Management Oversight," "Compensation Committee Interlocks and Insider Participation" and "Compensation of Directors" in the Company's proxy statement for its 2020 annual meeting of shareholders to be filed no later than April 29, 2020.

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

The information required by Item 12 is incorporated by reference to the sections entitled "Security Ownership of Certain Beneficial Owners," "Security Ownership of Management," and "Equity Compensation Plan Information" in the Company's proxy statement for its 2020 annual meeting of shareholders to be filed no later than April 29, 2020.

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

The information required by Item 13 is incorporated by reference to the sections entitled "Certain Relationships and Related Transactions" and "Director Independence" in the Company's proxy statement for its 2020 annual meeting of shareholders to be filed no later than April 29, 2020.

#### **ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES**

The information required by Item 14 is incorporated by reference to the sections entitled "Audit Committee Report" and "Relationship with Independent Auditors" in the Company's proxy statement for its 2020 annual meeting of shareholders to be filed no later than April 29, 2020.

## PART IV

### **ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES**

- (a) Listing of Documents
1. The financial statements and schedule of Armstrong World Industries, Inc. filed as a part of this 2019 Annual Report on Form 10-K is listed in the “Index to Financial Statements and Schedules” on Page 32.
  2. The financial statements required to be filed pursuant to Item 15 of Form 10-K are:  
Worthington Armstrong Venture consolidated financial statements for the years ended December 31, 2019, 2018, and 2017 (filed herewith as Exhibit 99.1).
  3. The following exhibits are filed as part of this 2019 Annual Report on Form 10-K:

<b><u>Exhibit No.</u></b>	<b><u>Description</u></b>
---------------------------	---------------------------

- |      |  |
|------|--|
| 2.1  | Armstrong World Industries, Inc.’s Fourth Amended Plan of Reorganization dated May 23, 2003 (as modified by modifications filed with the Bankruptcy Court on October 17, 2003, November 10, 2003, December 3, 2004 and February 21, 2006) is incorporated by reference from the Annual Report on Form 10-K, filed on February 24, 2006, wherein it appeared as Exhibit 2.3.  |
| 2.2  | Separation and Distribution Agreement, dated March 11, 2016, by and between Armstrong World Industries, Inc. and Armstrong Flooring, Inc. is incorporated by reference from the Current Report on Form 8-K filed on March 15, 2016, wherein it appeared as Exhibit 2.1.  |
| 2.3  | Plan of Division, adopted by Armstrong World Industries, Inc. on March 11, 2016 is incorporated by reference from the Current Report on Form 8-K filed on March 15, 2016, wherein it appeared as Exhibit 2.2.  |
| 3.1  | Amended and Restated Articles of Incorporation of Armstrong World Industries, Inc. is incorporated by reference from the Current Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 3.1.   |
| 3.2  | Amended and Restated Bylaws of Armstrong World Industries, Inc., are incorporated by reference from the Current Report on Form 8-K filed on December 8, 2017, wherein it appeared as Exhibit 3.1.  |
| 4.1  | Description of Securities Registered under Section 12 of the Securities Exchange Act of 1934.†   |
| 10.1 | Amended and Restated Credit Agreement, dated April 1, 2016, by and among Armstrong World Industries, Inc., as Borrower, certain subsidiaries of Armstrong World Industries, Inc. identified therein, as the Guarantors, Bank of America, N.A., as Administrative Agent and Collateral Agent, the other lenders party thereto, JPMorgan Chase Bank, N.A. and Citibank, N.A., as Co-Syndication Agents, Manufacturers and Traders Trust, The Bank of Nova Scotia, Fifth Third Bank, Citizens Bank of Pennsylvania, TD Bank National Association and Bank of Montreal, as Co-Documentation Agents, and Merrill Lynch, Pierce, Fenner & Smith Incorporated, JPMorgan Chase Bank, N.A. and Citibank, N.A., as joint lead arrangers and joint lead managers is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.8.                                  |
| 10.2 | Amended and Restated Security Agreement, dated April 1, 2016, by and among Armstrong World Industries, Inc., the grantors named therein and Bank of America, N.A. is incorporated by reference from the Annual Report on Form 10-K, filed on February 26, 2018, wherein it appeared as Exhibit 10.2.   |
| 10.3 | Amended and Restated Pledge Agreement dated, April 1, 2016, by and among Armstrong World Industries, Inc., the pledgors named therein and Bank of America, N.A. is incorporated by reference from the Annual Report on Form 10-K, filed on February 26, 2018, wherein it appeared as Exhibit 10.3.   |
| 10.4 | Amended and Restated Canadian Pledge Agreement dated, April 1, 2016, by and among Armstrong World Industries, Inc. and Bank of America, N.A. is incorporated by reference from the Annual Report on Form 10-K, filed on February 26, 2018, wherein it appeared as Exhibit 10.4.  |
| 10.5 | Second Amendment to Credit Agreement, Amendment to Security Agreement, Amendment to Domestic Pledge Agreement and Amendment to Canadian Pledge Agreement by and among the Company, the guarantors named therein, JPMorgan Chase Bank, N.A., Citizens Bank, N.A., Fifth Third Bank and PNC Bank, National Association, as co-syndication agents, Branch Banking and Trust Company, TD Bank, N.A., Manufacturers and Traders Trust Company, The Bank of Nova Scotia, Capital One, National Association, Keybank National Association, U.S. Bank National Association and Wells Fargo Bank, National Association, as co-documentation agents, and other lenders and L/C issuers party hereto and BofA Securities, Inc., JPMorgan Chase Bank, N.A., Citizens Bank, N.A., Fifth Third Bank and PNC Capital Markets, LLC, as joint lead arrangers and bookrunners, in incorporated by reference from the Current Report on |

<u>Exhibit No.</u>	<u>Description</u>
	Form 8-K, filed on October 1, 2019, wherein it appeared as Exhibit 10.1.
10.6	Receivables Purchase Agreement dated as of December 10, 2010, by and among Armstrong World Industries, Inc., as initial servicer and collection agent, Armstrong Receivables Company LLC, as seller, Atlantic Asset Securitization LLC, as conduit purchaser, and Credit Agricole Corporate and Investment Bank, as administrative agent, an issuer of letters of credit and related committed purchaser, is incorporated by reference from the Current Report on Form 8-K filed on December 14, 2010, wherein it appeared as Exhibit 10.1.
10.7	Omnibus Amendment to Receivables Purchase Agreement and Purchase and Sale Agreement dated as of August 1, 2011, by and among Armstrong World Industries, Inc., Armstrong Receivables Company LLC, Armstrong Hardwood Flooring Company, Atlantic Asset Securitization LLC, and Credit Agricole Corporate and Investment Bank, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.9.
10.8	Second Omnibus Amendment to Receivables Purchase Agreement and Purchase and Sale Agreement dated as of December 21, 2011, by and among Armstrong World Industries, Inc., Armstrong Receivables Company LLC, as seller, Armstrong Hardwood Flooring Company, as originator, Atlantic Asset Securitization LLC, as resigning conduit purchaser, Credit Agricole Corporate and Investment Bank, as resigning administrative agent, resigning related committed purchaser and resigning LC bank, The Bank of Nova Scotia, as successor administrative agent, successor related committed purchaser and successor LC bank, and Liberty Street Funding LLC, as successor conduit purchaser, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.10.
10.9	Third Omnibus Amendment Agreement, dated as of March 28, 2013, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., Armstrong Hardwood Flooring Company, The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 29, 2013, wherein it appeared as Exhibit 10.1.
10.10	Fourth Amendment to the Receivables Purchase Agreement, dated as of December 18, 2014, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Annual Report on Form 10-K filed on February 23, 2015, wherein it appeared as Exhibit 10.10.
10.11	Fourth Omnibus Amendment Agreement, dated as of March 30, 2016, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., Armstrong Hardwood Flooring Company, The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2017, wherein it appeared as Exhibit 10.11.
10.12	Sixth Amendment to the Receivables Purchase Agreement, dated as of December 21, 2016, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2017, wherein it appeared as Exhibit 10.12.
10.13	Seventh Amendment to Receivables Purchase Agreement, dated March 24, 2017, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Quarterly Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 10.1.
10.14	Eighth Amendment to Receivables Purchase Agreement, dated February 15, 2019, by and among Armstrong Receivables Company, LLC, Armstrong World Industries, Inc., The Bank of Nova Scotia, and Liberty Street Funding LLC, is incorporated by reference from the Annual Report on Form 10-K filed on February 25, 2019, wherein it appeared as Exhibit 10.13.
10.15	Amended and Restated Joint Venture Agreement, dated February 22, 2016 between Armstrong Ventures, Inc. and Worthington Ventures, Inc., is incorporated by reference from the Annual Report on Form 10-K filed on February 22, 2016, wherein it appeared as Exhibit 10.12.
10.16	Tax Matters Agreement, dated as of April 1, 2016, by and between Armstrong World Industries, Inc. and Armstrong Flooring, Inc. is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.2.

<u>Exhibit No.</u>	<u>Description</u>
10.17	Trademark License Agreement, dated as of April 1, 2016, by and between Armstrong World Industries, Inc., AWI Licensing LLC and Armstrong Flooring, Inc. is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.4.
10.18	Transition Trademark License Agreement, dated as of April 1, 2016, by and between Armstrong World Industries, Inc., AFI Licensing LLC and Armstrong Flooring, Inc. is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.5.
10.19	Campus Lease Agreement, dated as of April 1, 2016, by and between Armstrong World Industries, Inc. and Armstrong Flooring, Inc. is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.6.
10.20	Share Purchase Agreement, dated November 17, 2017, by and between Armstrong World Industries, Inc. and Knauf International GmbH is incorporated by reference from the Current Report on Form 8-K filed on November 20, 2017, wherein it appeared as Exhibit 2.1.
10.21	Deed of Amendment to the Share Purchase Agreement dated as of July 18, 2018, by and between Armstrong World Industries, Inc. and Knauf International GmbH is incorporated by reference from the Current Report on Form 8-K filed on July 19, 2018, wherein it appeared as Exhibit 2.1.
10.22	2006 Long-Term Incentive Plan, as amended February 23, 2009, is incorporated by reference from the Annual Report on Form 10-K, filed on February 26, 2009, wherein it appeared as Exhibit 10.13.*
10.23	Form of Stock Option and Restricted Stock Unit Award under the 2006 Long-Term Incentive Plan used in connection with awards to Victor D. Grizzle in connection with new hire grant, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.26.*
10.24	2011 Long-Term Incentive Plan, effective as of June 24, 2011, is incorporated by reference to Armstrong World Industries, Inc.'s Definitive Proxy Statement on Schedule 14A for the Armstrong World Industries, Inc 2011 Annual Meeting of Shareholders held on June 24, 2011 filed on April 28, 2011, wherein it appeared as Exhibit A.*
10.25	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Nonqualified Stock Options — U.S. (Executive Officer)), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.1.*
10.26	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Nonqualified Stock Options — U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.2.*
10.27	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2013 (Grant of Nonqualified Stock Options – U.S. (Executive Officer)), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 29, 2013, wherein it appeared as Exhibit 10.2.*
10.28	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2013 (Grant of Nonqualified Stock Options – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 29, 2013, wherein it appeared as Exhibit 10.3.*
10.29	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2013 (Grant of Nonqualified Stock Options – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 29, 2013, wherein it appeared as Exhibit 10.4.*
10.30	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Nonqualified Stock Options – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 28, 2014, wherein it appeared as Exhibit 10.1.*
10.31	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Nonqualified Stock Options – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 28, 2014, wherein it appeared as Exhibit 10.2.*
10.32	Form of 2016 Long-Term Time-Based Restricted Stock Unit Grant under the 2011 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 8-K filed on July 11, 2016, wherein it appeared as Exhibit 10.4.*
10.33	Armstrong World Industries, Inc. 2016 Long-Term Incentive Plan, effective as of July 8, 2016 and amended and restated effective February 20, 2019, is incorporated by reference from the Annual Report on Form 10-K filed on February 25,

<u>Exhibit No.</u>	<u>Description</u>
	2019, wherein it appeared as Exhibit 10.42.*
10.34	Form of 2017, 2018 and 2019 Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Absolute TSR for Tier I) for Senior Executives under the 2016 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 10.2.*
10.35	Form of 2017, 2018 and 2019 Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Absolute TSR for Tier II) for Senior Executives under the 2016 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 10.4.*
10.36	Form of 2017, 2018 and 2019 Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Cumulative Free Cash Flow for Tier I) under the 2016 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 10.3.*
10.37	Form of 2017, 2018 and 2019 Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Cumulative Free Cash Flow for Tier II) under the 2016 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 10-Q filed on May 1, 2017, wherein it appeared as Exhibit 10.5.*
10.38	Nonqualified Deferred Compensation Plan effective January 2005, as amended July 23, 2010, is incorporated by reference from the Annual Report on Form 10-K, filed on February 28, 2011, wherein it appeared as Exhibit 10.4.*
10.39	Retirement Benefit Equity Plan, effective January 1, 2005, as amended October 29, 2007 and December 8, 2008, is incorporated by reference from the Annual Report on Form 10-K, filed on February 26, 2009, wherein it appeared as Exhibit 10.2.*
10.40	2006 Phantom Stock Unit Plan, as amended December 8, 2008, is incorporated by reference from the 2008 Annual Report on Form 10-K, filed on February 26, 2009, wherein it appeared as Exhibit 10.18.*
10.41	2006 Phantom Stock Unit Agreement is incorporated by reference from the Current Report on Form 8-K filed on October 26, 2006, wherein it appeared as Exhibit 10.3. A Schedule of Participating Directors is incorporated by reference from the 2006 Annual Report on Form 10-K, filed on March 30, 2007, wherein it appeared as Exhibit 10.36.*
10.42	2007 Award Agreement under the 2006 Phantom Stock Unit Plan is incorporated by reference from the Current Report on Form 8-K filed on October 23, 2007, wherein it appeared as Exhibit 10.1.*
10.43	Schedule of Participating Directors, is incorporated by reference from the Current Report on Form 8-K filed on October 23, 2007, wherein it appeared as Exhibit 10.2.*
10.44	2008 Directors Stock Unit Plan, as amended December 8, 2008, November 30, 2010 and June 24, 2011 is incorporated by reference to the Current Report on Form 8-K filed on June 13, 2011, wherein it appeared as Exhibit 99.2.*
10.45	Form of 2009 and 2010 Award under the 2008 Directors Stock Unit Plan, as amended, is incorporated by reference from the Quarterly Report on Form 10-Q for the quarter ended September 30, 2009, filed on October 28, 2009, wherein it appeared as Exhibit 10.27.*
10.46	Form of 2011, 2012, 2013 and 2014 Award under the 2008 Directors Stock Unit Plan, as amended, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.40.*
10.47	Armstrong World Industries, Inc. 2016 Directors Stock Unit Plan, is incorporated by reference from the Current Report on Form 8-K filed on July 11, 2016, wherein it appeared as Exhibit 10.1.*
10.48	Form of 2016, 2017, 2018 and 2019 Stock Unit Grant Agreement under the Armstrong World Industries, Inc. 2016 Directors Stock Unit Plan, is incorporated by reference from the Current Report on Form 8-K filed on July 11, 2016, wherein it appeared as Exhibit 10.3.*
10.49	Offer Letter to Victor D. Grizzle dated January 4, 2011, is incorporated by reference from the Current Report on Form 8-K filed on January 10, 2011, wherein it appeared as Exhibit 99.2.*
10.50	Offer Letter to Mark A. Hershey dated April 21, 2011, is incorporated by reference from the Current Report on Form 8-K filed on April 27, 2011, wherein it appeared as Exhibit 99.1.*
10.51	Form of Indemnification Agreement for Officers and Directors of Armstrong World Industries, Inc. is incorporated by reference from the Report on Form 8-K filed on June 4, 2010, wherein it appeared as Exhibit 10.1.*
10.52	Form of Amended and Restated Severance Agreement with Certain Officers, approved for use on October 26, 2016 is incorporated by reference from the Report on Form 8-K filed on October 31, 2016, wherein it appeared as Exhibit 10.1.*

<u>Exhibit No.</u>	<u>Description</u>
14	The Armstrong Code of Business Conduct, revised as of July 29, 2011, is incorporated by reference from the Current Report on Form 8-K filed on August 1, 2011, wherein it appeared as Exhibit 14.1.
21	Armstrong World Industries, Inc.'s Subsidiaries.†
23.1	Consent of Independent Registered Public Accounting Firm.†
23.2	Consent of Independent Auditors.†
31.1	Certification of Chief Executive Officer required by Rule 13a-15(e) or 15d-15(e) of the Securities Exchange Act.
31.2	Certification of Chief Financial Officer required by Rule 13a-15(e) or 15d-15(e) of the Securities Exchange Act.
32.1	Certification of Chief Executive Officer required by Rule 13a and 18 U.S.C. Section 1350 (furnished herewith).
32.2	Certification of Chief Financial Officer required by Rule 13a and 18 U.S.C. Section 1350 (furnished herewith).
99.1	Worthington Armstrong Venture consolidated financial statements as of December 31, 2019 and 2018 and for the years ended December 31, 2019, 2018 and 2017.†
101	Inline Interactive Data Files**
104	The cover page from the Company's Annual Report on Form 10-K for the year ended December 31, 2019 has been formatted in Inline XBRL.
	* Management Contract or Compensatory Plan.
	† Filed herewith.
	** XBRL – Information is furnished and not filed or a part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, is deemed not filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and otherwise is not subject to liability under these sections.

**ITEM 16. FORM 10-K SUMMARY**

None.



## SIGNATURES

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

ARMSTRONG WORLD INDUSTRIES, INC.  
(Registrant)

By: /s/ Victor D. Grizzle  
Director, President and Chief Executive Officer

Date: February 25, 2020

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Victor D. Grizzle</u> Victor D. Grizzle	Director, President and Chief Executive Officer (Principal Executive Officer)	February 25, 2020
<u>/s/ Brian L. MacNeal</u> Brian L. MacNeal	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	February 25, 2020
<u>/s/ Stephen F. McNamara</u> Stephen F. McNamara	Vice President and Controller (Principal Accounting Officer)	February 25, 2020
<u>/s/ Stanley A. Askren</u> Stanley A. Askren	Director	February 25, 2020
<u>/s/ Tao Huang</u> Tao Huang	Director	February 25, 2020
<u>/s/ Barbara L. Loughran</u> Barbara L. Loughran	Director	February 25, 2020
<u>/s/ Larry S. McWilliams</u> Larry S. McWilliams	Director	February 25, 2020
<u>/s/ James C. Melville</u> James C. Melville	Director	February 25, 2020
<u>/s/ John J. Roberts</u> John J. Roberts	Director	February 25, 2020
<u>/s/ Wayne R. Shurts</u> Wayne R. Shurts	Director	February 25, 2020
<u>/s/ Roy W. Templin</u> Roy W. Templin	Director	February 25, 2020
<u>/s/ Cheryl T. Thomas</u> Cheryl T. Thomas	Director	February 25, 2020

## SCHEDULE II

Armstrong World Industries, Inc., and Subsidiaries  
Valuation and Qualifying Reserves  
(amounts in millions)

	<u>Balance at beginning of year</u>		<u>Additions charged to earnings</u>		<u>Deductions</u>		<u>Balance at end of year</u>
<u>2017</u>							
Provision for bad debts	\$ 0.4	\$	-	\$	(0.1)	\$	0.3
Provision for discounts	1.3		17.6		(17.4)		1.5
Provision for warranties	0.2		3.2		(3.3)		0.1
<u>2018</u>							
Provision for bad debts	\$ 0.3	\$	0.1	\$	(0.1)	\$	0.3
Provision for discounts	1.5		19.2		(19.4)		1.3
Provision for warranties	0.1		4.2		(3.9)		0.4
<u>2019</u>							
Provision for bad debts	\$ 0.3	\$	0.7	\$	(0.3)	\$	0.7
Provision for discounts	1.3		21.0		(20.9)		1.4
Provision for warranties	0.4		3.0		(3.2)		0.2
Provision for inventory obsolescence	-		0.6		(0.1)		0.5

I, Victor D. Grizzle, certify that:

- 1) I have reviewed this report on Form 10-K of Armstrong World Industries, Inc.;
- 2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
- 3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
- 4) The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
- 5) The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - a) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 25, 2020

/s/ Victor D. Grizzle

Victor D. Grizzle

Director, President and Chief Executive Officer

I, Brian L. MacNeal, certify that:

- 1) I have reviewed this report on Form 10-K of Armstrong World Industries, Inc.;
- 2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
- 3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
- 4) The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
- 5) The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal controls over financial reporting.

Date: February 25, 2020

/s/ Brian L. MacNeal

Brian L. MacNeal

Senior Vice President and Chief Financial Officer

Certification of Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

I certify to the best of my knowledge and belief that the Annual Report on Form 10-K of Armstrong World Industries, Inc. (the “Company”) containing its financial statements for the fiscal year ended December 31, 2019 fully complies with the requirements of Section 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, and that information contained in that report fairly presents, in all material respects, the financial condition and results of operations of the Company as of that date.

/s/ Victor D. Grizzle

Victor D. Grizzle  
Director, President and Chief Executive Officer  
Armstrong World Industries, Inc.

Dated: February 25, 2020

Certification of Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

I certify to the best of my knowledge and belief that the Annual Report on Form 10-K of Armstrong World Industries, Inc. (the “Company”) containing its financial statements for the fiscal year ended December 31, 2019 fully complies with the requirements of Section 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, and that information contained in that report fairly presents, in all material respects, the financial condition and results of operations of the Company as of that date.

/s/ Brian L. MacNeal

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Brian L. MacNeal  
Senior Vice President and Chief Financial Officer  
Armstrong World Industries, Inc.

Dated: February 25, 2020

## **CORPORATE INFORMATION**

### **COMPANY PROFILE**

Established in 1860, Armstrong World Industries, Inc. is a global leader in the design and manufacture of floors and ceilings. In 2019, Armstrong's consolidated net sales totaled approximately \$1,038.1 million (on a continuing operations basis). Based in Lancaster, PA, Armstrong has a global manufacturing network of 14 facilities, including five plants dedicated to its WAVE joint venture, and has approximately 2,500 employees worldwide as of December 31, 2019.

### **INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

KPMG LLP  
Philadelphia, PA

### **CORPORATE OFFICES / INFORMATION**

Armstrong World Industries, Inc.  
2500 Columbia Avenue  
Lancaster, PA 17603

Additional information about Armstrong is available without charge to shareholders by directing a request to Investor Relations:

Thomas J. Waters, [twaters@armstrongceilings.com](mailto:twaters@armstrongceilings.com)

Corporate Website:  
<http://www.armstrongceilings.com>  
For Investors: 717.396.6354  
For News media: 866.321.6677

Mailing Address:  
Armstrong World Industries, Inc.  
P.O. Box 3001  
Lancaster, PA 17604-3001

### **STOCK LISTING**

Armstrong's shares are listed on the New York Stock Exchange under the symbol AWI.

### **TRANSFER AGENT AND REGISTRAR**

American Stock Transfer & Trust Company  
6201 15<sup>th</sup> Avenue  
Brooklyn, NY 11219  
[www.amstock.com](http://www.amstock.com)

### **ANNUAL MEETING OF SHAREHOLDERS**

The 2020 Annual Meeting of Shareholders of Armstrong World Industries, Inc. will be held via the Internet on June 25, 2020 at 8:00 a.m. Eastern Time.

### **CERTIFICATIONS**

The certifications of our Chief Executive Officer and Chief Financial Officer, as required by Section 302 of the Sarbanes-Oxley Act of 2002, have been filed with the Securities and Exchange Commission as exhibits to our Annual Report on Form 10-K.

In addition, in 2019 our Chief Executive Officer provided the required annual certification to the New York Stock Exchange.

### **FORWARD-LOOKING STATEMENTS**

Certain information in this report and in our other public documents and comments contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Those statements provide our future expectations or forecasts and can be identified by our use of words such as "anticipate," "estimate," "expect," "project," "intend," "plan," "believe," "outlook," and other words or phrases of similar meaning in connection with any discussion of future operating or financial performance. Forward-looking statements, by their nature, address matters that are uncertain and involve risks because they relate to events and depend on circumstances that may or may not occur in the future. A more detailed discussion of the risks and uncertainties that could cause our actual results to differ materially from those projected, anticipated or implied is included in the "Risk Factors" and "Management's Discussion and Analysis" sections of our recent reports on Forms 10-K and 10-Q filed with the U.S. Securities and Exchange Commission. As a result, our actual results may differ materially from our expected results and from those expressed in our forward-looking statements. Forward-looking statements speak only as of the date they are made. We undertake no obligation to update any forward-looking statements beyond what is required under applicable securities law.

## 2019 BOARD OF DIRECTORS

**Stan A. Askren**<sup>(1)(2)(4)</sup>

CEO and Founder, Quiet Trail Advisors

**Victor D. Grizzle**

CEO and President, Armstrong World Industries, Inc.

**Tao Huang**<sup>(1)(4)</sup>

CEO, Supernova Companies

**Barbara L. Loughran**<sup>(1)(4)</sup>

Former Partner, PricewaterhouseCoopers

**James C. Melville**<sup>(2)(3)(4)</sup>

Member, Kaplan, Strangis and Kaplan, P.A.

**Larry S. McWilliams, Chairman**

Co-Chief Executive Officer, Compass Marketing, Inc.

**Gregory P. Spivy**<sup>(2)(4)(5)</sup>

Partner, ValueAct Capital

**John J. Roberts**<sup>(1)(3)</sup>

Former Global Managing Partner of  
PricewaterhouseCoopers

**Wayne R. Shurts**<sup>(1)(2)</sup>

Former Executive Vice President and  
Chief Technology Officer, Sysco Corporation

**Roy W. Templin**<sup>(1)(2)(3)(4)</sup>

Former Chairman of the Board, Con-Way Incorporated

**Cherryl T. Thomas**<sup>(1)(2)(3)</sup>

Chief Strategy Officer and Vice President, Ardmore  
Roderick

- <sup>(1)</sup> Audit Committee
- <sup>(2)</sup> Management Development and Compensation Committee
- <sup>(3)</sup> Nominating, Governance and Social Responsibility Committee
- <sup>(4)</sup> Finance Committee
- <sup>(5)</sup> Retired in 2019

## MANAGEMENT

**Victor D. Grizzle**

CEO and President

**Brian L. MacNeal**

Senior Vice President and Chief Financial Officer

**Charles M. Chiappone**

Senior Vice President, Ceilings and Wall Solutions

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