

ARMSTRONG WORLD INDUSTRIES INC  
Form 10-K  
February 27, 2017

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, 2016

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 23-0366390  
(State or other jurisdiction of (I.R.S. Employer  
incorporation or organization) Identification No.)

2500 Columbia Avenue, Lancaster, Pennsylvania 17603  
(Address of principal executive offices) (Zip Code)

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

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

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Title of each class

Common Stock (\$0.01 par value)

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter time period that the registrant was required to submit and post such files). Yes No

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

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

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

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 (\$39.15 per share) on the New York Stock Exchange (trading symbol AWI) of June 30, 2016 was approximately \$1,800 million. As of February 21, 2017, the number of shares outstanding of registrant's Common Stock was 53,839,882.

Documents Incorporated by Reference

Certain sections of Armstrong World Industries, Inc.'s definitive Proxy Statement for use in connection with its 2017 annual meeting of shareholders, to be filed no later than May 1, 2017 (120 days after the last day of our 2016 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 EBITDA (as such terms are defined by documents incorporated by reference herein). Words such as “anticipate,” “expect,” “intend,” “plan,” “target,” “project,” “predict,” “believe,” “may,” “will,” “would,” “could,” “should,” “seek,” “estimate” and similar expressions 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:

- global economic conditions;
- construction activity;
- the tax consequences of the separation of our flooring business from our ceilings (buildings products) business;
- competition;
- key customers;
- availability and costs of raw materials and energy;
- international operations;
- Worthington Armstrong Venture (“WAVE”), our joint venture with Worthington Industries, Inc;
- environmental matters;
- covenants in our debt agreements;
- our indebtedness;
- our liquidity;
- strategic transactions;
- negative tax consequences;
- defined benefit plan obligations;
- claims and litigation;
- labor;
- intellectual property rights;
- cost savings and productivity initiatives; 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 and in the documents incorporated by reference.

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 global producer of ceiling systems and, prior to April 1, 2016, flooring products for use primarily in the construction and renovation of residential, commercial and institutional buildings. We design, manufacture and sell ceiling systems (primarily mineral fiber, fiberglass wool and metal) and, prior to April 1, 2016, flooring products (primarily resilient and wood) around the world.

On April 1, 2016, we completed our previously announced separation of Armstrong Flooring, Inc. (“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. Subsequent to the separation and distribution, AWI and AFI operate as two independent, publicly-traded companies, with AFI owning and operating the Resilient Flooring and Wood Flooring segments and AWI continuing to own and operate the Building Products (Ceilings) segment. AFI’s historical financial results have been reflected in AWI’s Consolidated Financial Statements as a discontinued operation for all periods presented. See Note 4 to the Consolidated Financial Statements for additional information.

We are focused on driving sustainable shareholder value creation. Our strategic priorities are to accelerate profitable volume growth globally and to improve the returns in our international business. Our primary goal is to expand into new and grow in existing markets by selling a broader array of products and solutions into those markets.

#### Reportable Segments

Effective April 1, 2016 and in connection with our separation of AFI, our former Resilient Flooring and Wood Flooring segments have been excluded from our results of continuing operations. In addition, effective April 1, 2016, we disaggregated our former Building Products operating segment into the following three distinct geographical segments: Americas (including Canada); Europe, Middle East and Africa (including Russia) (“EMEA”); and Pacific Rim. See Note 3 to the Consolidated Financial Statements and Management’s Discussion and Analysis of Financial Condition and Results of Operations in Item 7 of this Form 10-K for additional financial information on our reportable segments.

#### Markets

We are well positioned in the industry segments and markets in which we operate, often holding a leadership or significant market share position. The major markets in which we compete are:

North American Commercial. Many of our products are used in commercial and institutional buildings. Our revenue opportunities come from new construction as well as renovation of existing buildings. Renovation work is estimated to represent the majority of the total North American commercial market opportunity. Most of our revenue comes from four major segments of commercial building – office, education, retail and healthcare. We monitor U.S. construction starts and follow 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, 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. However, we believe that consumers’ preferences for product type, style, color, availability, affordability and ease of installation also affect our revenue.

North American Residential. Our Americas segment sells products for use in single and multi-family housing. Our products compete against mineral fiber and fiberglass products from other manufacturers, as well as drywall. We compete directly with other domestic and international suppliers of these products. We estimate that existing home renovation (also known as replacement / remodel) work represents the majority of the total North American 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.

Outside of North America. About 30% of our 2016 consolidated sales were in EMEA and the Pacific Rim and almost all were commercial in nature. For the countries in which we have significant revenue, we monitor various national statistics (such as GDP) as well as construction data (starts and project-related information). Revenues come primarily from new construction and renovation work.

The following table provides an estimate of our major markets that affected 2016 net sales.

(Estimated percentages of individual segment's sales)	North American		North American		Outside of North America		Total
	Residential		Commercial		Outside of North America		
	New	Renovation	New	Renovation	New	Renovation	
Americas	0 %	5 %	20 %	75 %	0 %	0 %	100 %
EMEA	-	-	-	-	55 %	45 %	100 %
Pacific Rim	-	-	-	-	80 %	20 %	100 %
Total	0 %	5 %	15 %	50 %	20 %	10 %	100 %

Management has used estimates in creating the table above because the end-use of our products is not easily determinable.

#### Geographic Areas

See Note 3 to the Consolidated Financial Statements and Management's Discussion and Analysis of Financial Condition and Results of Operations in Item 7 of this Form 10-K for additional financial information by geographic areas.

#### Customers

We use our reputation, capabilities, service 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. In our North American retail channel, which sells to end-users in the residential and light commercial segments, we have important relationships with national home centers such as Lowe's Companies, Inc. and The Home Depot, Inc., as well as wholesalers who re-sell our products to dealers who service builders, contractors and consumers.

Approximately 80% of our consolidated net sales are to distributors. Sales to large home centers account for less than 10% of our consolidated sales. Our remaining sales are to contractors and retailers.

Revenues from two commercial distributors, included within our Americas segment, individually exceeded 10% of our consolidated revenues in 2016. Net sales in 2016 to these two customers totaled \$284.0 million. Net sales of \$131.7 million from one of these customers also exceeded 10% of our consolidated revenues in 2015. No one customer accounted for 10% or more of our total consolidated net sales in 2014.

#### 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 the vast majority of 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



We face strong competition in all of our businesses. Principal attributes of competition include product performance, product styling, service and price. Competition in North America comes from both domestic and international manufacturers. Additionally, some of our products compete with alternative products or finishing solutions. Our products compete with drywall and exposed structure (also known as open plenum). Excess industry capacity exists for certain products in some geographies, 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), Georgia-Pacific Corporation, Knauf AMF GmbH & Co. KG, Lafarge SA, Odenwald Faserplattenwerk GmbH, Rockfon A/S (owned by Rockwool International), Saint-Gobain and USG Corporation.

## Raw Materials

We purchase raw materials from numerous suppliers worldwide in the ordinary course of business. The principal raw materials include: mineral fiber, fiberglass, perlite, waste paper, pigments, clays and starches. In addition, we use aluminum and steel in the production of metal ceilings 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 the Pacific Rim and Europe. Sales of sourced products represented approximately 10% of our total consolidated revenue in 2016.

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 in North America and Europe tend to be stronger in the second and third quarters of our fiscal year due to more favorable weather conditions, customer business cycles, the timing of renovation and new construction. We see similar patterns with respect to our sales in the Pacific Rim, though the timing of the Chinese New Year can affect buying behaviors.

## Patent and Intellectual Property Rights

Patent protection is important to our business. Our competitive position has been enhanced by U.S. and foreign 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®, BioGuard™, Calla®, Cirrus®, Cortega®, Dune™, Huiyi™, Humiguard®, Infusions®, Lyra®, MetalWorks™, Optima®, Perla™, Soundscapes®, Total Acoustics™, Ultima®, and WoodWorks®, are important to our business because of their significant brand name recognition. Trademark protection continues in some countries as long as the mark is used, and continues in other countries as long as the mark is registered. Registrations are generally for fixed, but renewable, terms.

In connection with the separation and distribution of AFI, 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.

We review the carrying value of trademarks 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, 2016, we had approximately 3,700 full-time and part-time employees worldwide compared to approximately 3,800 (excluding AFI) as of December 31, 2015. Effective April 1, 2016, approximately 3,900 of our former employees were employed by AFI as a result of the separation.

As of December 31, 2016, approximately 73% of our 940 production employees in the U.S. were represented by labor unions. Collective bargaining agreements covering approximately 300 employees at two U.S. plants will expire during 2017. Outside the U.S., most of our production employees are covered by either industry-sponsored and/or state-sponsored collective bargaining mechanisms. During the fourth quarter of 2016, we idled one of our plants in China. As a result, we expect a reduction of approximately 190 employees in China in the first quarter of 2017. 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. We incurred \$18.8 million in 2016, \$19.7 million in 2015 and \$19.8 million in 2014 of R&D expenses worldwide.

### Sustainability and Environmental Matters

The adoption of environmentally responsible building codes and standards such as the Leadership in Energy and Environmental Design, or 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.

### 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 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 (“PRPs”) 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 manufacturing and certain of our research 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.

We are involved in 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 various litigation matters that involve product liability, tort liability and other claims under a wide range of 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 \$4.7 million and \$6.0 million as of December 31, 2016 and December 31, 2015, respectively, were recorded for potential environmental liabilities and relating to locations for which we are a PRP 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. Reference in this Form 10-K to our website is an inactive text reference only. 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. These materials are also available from the SEC's website at [www.sec.gov](http://www.sec.gov).

#### ITEM 1A. RISK FACTORS

Worldwide economic conditions could have a material adverse impact on our financial condition, liquidity or results of operations.

Our business is influenced by conditions in domestic and foreign economies, 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 product;
  - 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 adversely affect 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.

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.

Our markets are highly competitive. Competition can reduce demand for our products or cause us to lower prices. Failure to compete effectively by meeting consumer preferences, developing and marketing innovative solutions, maintaining strong customer service and distribution relationships, growing market share, and expanding our solutions capabilities and reach could adversely affect our results.

Our markets are highly competitive. Competition can reduce demand for our products, negatively affect our product sales mix or cause us to lower prices. Failure to compete effectively by meeting consumer preferences, developing and marketing innovative solutions, maintaining strong customer service and distribution relationships, growing market share and expanding our solutions capabilities and reach could have a material adverse effect on our financial condition, liquidity or results of operations. 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 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. In addition, excess industry capacity for certain products in several geographic markets could lead to industry consolidation and/or increased price competition. In certain local markets, we are also subject to potential increased price competition from foreign competitors, which may have lower cost structures.

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.

Some of our markets are dependent on certain key customers, including independent distributors. The loss, reduction, or fluctuation of sales to key customers, 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.

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. 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.

We are subject to risks associated with our international operations in both established and emerging markets. Legislative, political, regulatory and economic volatility, as well as vulnerability to infrastructure and labor disruptions, could have an adverse effect on our financial condition, liquidity or results of operations.

A significant portion of our products move in international trade, with approximately 30% of our revenues from operations outside the United States and Canada in 2016. 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, high costs in repatriating profits to the United States from some countries, 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 certain emerging markets. 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 globally, including in emerging markets, we may have difficulty anticipating and effectively managing these and other risks that our international operations may face, which may adversely affect our business outside the United States and 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. We believe an 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.

We may be subject to liability under, and may make substantial future expenditures to comply with environmental laws and regulations, which could materially adversely affect 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 domestic and foreign 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 materially adversely affect our financial condition, liquidity or results of operations.

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 materially adversely affect our financial condition, liquidity or results of operations.

We require a significant amount of liquidity to fund our operations, and borrowing has increased our vulnerability 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 adversely affect our financial condition or results of operations.

We may pursue strategic transactions that could create risks and present unforeseen integration obstacles or costs, any of which could materially adversely affect our financial condition, liquidity or results of operations.

We have evaluated, and expect to continue to evaluate, potential strategic transactions as opportunities arise. We routinely engage in discussions with third parties regarding potential transactions, including joint ventures, which could be significant. 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. Because our income tax expense for any period depends heavily on the mix of income derived from the various taxing jurisdictions, 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 the effective tax rate as a result of a change in the mix of earnings in countries with differing statutory tax rates, changes in our overall profitability, changes in tax legislation and rates, changes in the amount of earnings permanently reinvested offshore, 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, or FTCs, and state net operating losses, or 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 and NOLs.

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 pension and postretirement plans throughout the world, with the most significant plans located 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 underfunded by \$9.5 million as of December 31, 2016. Our unfunded U.S. postretirement plan liabilities were \$93.1 million as of December 31, 2016. 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.

Adverse judgments in 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.

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 U.S. and international 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.

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.

Our cost-saving and productivity 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 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.

#### ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

#### ITEM 2. PROPERTIES

Our world headquarters is in Lancaster, Pennsylvania. We own a 100-acre, multi-building campus comprising the site of our corporate headquarters, most of our operational headquarters, our U.S. R&D operations and marketing, and customer service headquarters.

We produce and market Armstrong products and services throughout the world. As of December 31, 2016, we had 15 manufacturing plants in eight countries. Three of our plants are leased and the remaining 12 are owned. We operate six plants located throughout the United States. In addition, our WAVE joint venture operates 9 additional plants in five countries.



Number  
of

Plants      Location of Principal Facilities

15            U.S. (Florida, Georgia, Ohio, Oregon, Pennsylvania and West Virginia), Austria, Canada, China, France, Germany, Russia and the U.K.

During the fourth quarter of 2016, we idled one of our plants in China.

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

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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 MARKET FOR THE REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS  
5. 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 21, 2017, there were approximately 280 holders of record of AWI's common stock.

	First	Second	Third	Fourth	Total Year
<b>2016</b>					
Price range of common stock - high	\$48.66	\$48.39	\$45.75	\$45.00	\$48.66
Price range of common stock - low	\$35.92	\$36.33	\$37.49	\$36.38	\$35.92
<b>2015</b>					
Price range of common stock - high	\$58.42	\$58.96	\$60.70	\$52.33	\$60.70
Price range of common stock - low	\$48.60	\$52.94	\$46.47	\$44.43	\$44.43

The above figures represent the high and low intra-day sale prices for our common stock as reported by the New York Stock Exchange. Historical prices have not been restated as a result of our separation of AFI.

There were no dividends declared during 2016 or 2015.

Dividends are paid 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. 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

Period	Total Number of Shares Purchased <sup>1</sup>	Average Price Paid per Share	Part of Publicly Announced Plans or Programs	Maximum Approximate Value of Shares that may yet be Purchased under the Plans or Programs
				Purchased as

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October 1 – 31, 2016	262,356	\$ 40.12	262,112	\$ 131,653,141
November 1 – 30, 2016	589,404	\$ 38.07	586,858	109,310,207
December 1 – 31, 2016	77,517	\$ 42.51	75,224	106,118,019
Total	929,277		924,194	

<sup>1</sup>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 long-term incentive plans. For more information regarding securities authorized for issuance under our equity compensation plans, see Note 21 to the Consolidated Financial Statements included in this Form 10-K.

On July 29, 2016, the Company announced that its Board of Directors had approved a share repurchase program pursuant to which the Company is authorized to repurchase up to \$150.0 million of its outstanding shares of common stock through July 31, 2018 (the “Program”). Repurchases under the Program may be made through open market, block and privately-negotiated transactions, including Rule 10b5-1 plans, at 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 the Company to repurchase any particular amount of common stock and may be suspended or discontinued at any time without notice. During 2016, 1.1 million shares were repurchased under the Program for a total cost of \$43.8 million, or an average price of \$39.45 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.

	2016	2015	2014	2013	2012
(amounts in millions, except for per-share data)					
Income statement data					
Net sales	\$1,234.5	\$1,231.3	\$1,294.3	\$1,264.6	\$1,218.9
Operating income	184.6	140.5	198.1	196.8	180.7
Earnings from continuing operations	93.9	26.6	79.1	88.4	89.3
Per common share - basic (a)	\$1.69	\$0.48	\$1.43	\$1.52	\$1.51
Per common share - diluted (a)	\$1.68	\$0.47	\$1.42	\$1.51	\$1.49
Dividends declared per share of common stock	-	-	-	-	\$8.55
Balance sheet data (end of period)					
Total assets	\$1,758.0	\$2,687.2	\$2,599.6	\$2,907.7	\$2,830.4
Long-term debt	848.6	936.2	986.3	1,023.7	1,004.1
Total shareholders' equity	266.4	768.8	649.1	673.2	719.1

Notes:

(a) See definition of basic and diluted earnings per share in Note 2 to the Consolidated Financial Statements.

## 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 global producer of ceiling systems and, prior to April 1, 2016, flooring products for use primarily in the construction and renovation of residential, commercial and institutional buildings. We design, manufacture and sell ceiling systems (primarily mineral fiber, fiberglass wool and metal) and, prior to April 1, 2016, flooring products (primarily resilient and wood) around the world.

On April 1, 2016, we completed our previously announced separation of Armstrong Flooring, Inc. ("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. Subsequent to the separation and distribution, AWI and AFI operate as two independent, publicly-traded companies, with AFI owning and operating the Resilient Flooring and Wood Flooring segments and AWI continuing to own and operate the Building Products (Ceilings) segment. AFI's historical financial results have been reflected in AWI's Consolidated Financial Statements as a discontinued operation for all periods presented.

We are focused on driving sustainable shareholder value creation. Our strategic priorities are to accelerate profitable volume growth globally and to improve the returns in our international business. Our primary goal is to expand into new and grow in existing markets by selling a broader array of products and solutions into those markets.

As of December 31, 2016, we had 15 manufacturing plants in eight countries, including six plants located throughout the U.S. During the fourth quarter of 2016 we idled one of our mineral fiber plants in China.

Worthington Armstrong Venture ("WAVE"), our joint venture with Worthington Industries, Inc. in which we hold a 50% equity interest, operates 9 additional plants in five countries to produce suspension system (grid) products, which we use and sell in our ceiling systems.

### Reportable Segments

Effective April 1, 2016 and in connection with our separation of AFI, our former Resilient Flooring and Wood Flooring segments have been excluded from our results of continuing operations. In addition, effective April 1, 2016, we disaggregated our former Building Products operating segment into the following three distinct geographical segments: Americas (including Canada); Europe, Middle East and Africa (including Russia) ("EMEA"); and Pacific Rim.

Each of our geographical segments produce suspended fiber and metal ceilings for use in commercial and institutional settings in addition to sourcing complimentary ceiling products. Commercial ceiling materials and accessories are sold to resale distributors and to ceiling systems contractors. Residential ceiling products are sold in the Americas primarily to wholesalers and retailers (including large home centers). Each segment also includes our WAVE joint venture, which manufactures suspension system (grid) products that are invoiced by both us and WAVE. In each of our segments, WAVE primarily sells its suspension system products directly to customers, for which we provide sales and administrative support. To a lesser extent, however, in some markets, WAVE sells its suspension systems products to us for resale to customers. Our segment results reflect those sales transactions.

In addition, effective April 1, 2016, we reclassified the majority of the assets and liabilities formally allocated to our Unallocated Corporate segment to our Americas segment for all periods presented. The assets and liabilities reclassified to our Americas segment most notably included the Armstrong trade name intangible asset, property, plant and equipment comprised primarily of Corporate campus facilities, the cash surrender value of life insurance supporting deferred compensation liabilities and income tax assets and liabilities and pension and postretirement assets and liabilities.

Balance sheet items classified as Unallocated Corporate primarily include cash and cash equivalents and outstanding borrowings under our senior credit facilities.

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

Effective January 1, 2016, in anticipation of the April 1, 2016 AFI separation, the majority of our historical corporate support functions, representing costs of approximately \$85 million for 2016 were incorporated into our Americas segment. As a result, Unallocated Corporate support expenses have decreased significantly during 2016 in comparison to 2015.

For 2016, 2015 and 2014, Unallocated Corporate segment operating (loss) was comprised of the following (dollar amounts in millions):

	2016	2015	2014
Corporate expenses	\$(4.3 )	\$(90.0 )	\$(66.6)
Separation costs	(34.5)	(34.3 )	-
Total Unallocated Corporate segment operating (loss)	\$(38.8)	\$(124.3)	\$(66.6)

## Factors Affecting Revenues

For information on our segments' 2016 net sales by geography, see Note 3 to the Consolidated Financial Statements included in this Form 10-K.

**Markets.** We compete in building material markets around the world, with the majority of our sales in the Americas. We closely monitor publicly available macroeconomic trends that provide insight into commercial and residential market activity, including Gross Domestic Product, office vacancy rates, the Architecture Billings Index, new commercial construction starts, state and local government spending, corporate profits and retail sales.

In addition, we noted several factors and trends within our markets that directly affected our business performance during 2016, including:

## Americas

We believe we experienced growth from new construction and, to a lesser extent, renovation and remodel activity, based on the mix of products sold. Both new construction and renovation activity were strong in the first half of 2016, with new construction activity continuing its momentum, albeit at a more moderate pace, throughout the second half of the year.

## EMEA

We experienced continued softness in commercial sectors, such as office, education and healthcare. Market opportunities continue to be hindered by low global oil prices, particularly in economies closely linked to oil, such as Russia and the Middle East. While recent improvements in oil prices have begun to positively impact market opportunities in Russia, building activity in the Middle East continues to be negatively impacted by lower project funding.

## Pacific Rim



Commercial office markets in China continued to experience challenging conditions, while India markets were impacted by tight project financing.

**Average Unit Value.** We periodically modify prices in each of our business segments 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 competitive reactions and changing market conditions. Additionally, we 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. 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 and geographic mix impacting our revenues. We estimate that favorable AUV increased our total consolidated net sales for the full year of 2016 by approximately \$24 million compared to 2015.

In the first quarter of 2016, we implemented ceiling tile pricing increases in the Americas, EMEA and Pacific Rim. In the second quarter of 2016, we implemented price increases on grid products in the Americas. In the third quarter of 2016 we implemented price increases on ceilings tiles in the Americas and grid products in EMEA. We also announced price increases on ceiling tile and grid products in the Americas effective in the first quarter of 2017. We may implement additional pricing actions based on upon future movements in raw material prices or foreign currency valuations.

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

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, mineral wool, perlite, starch and waste paper. 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 2016, the costs for raw materials, sourced products and energy positively impacted operating income by approximately \$9 million, compared to 2015.

We continue to evaluate the efficiency of our manufacturing footprint and may take additional actions in support of our cost and standardization initiatives. The charges associated with any additional cost reduction initiatives could include severance and related termination benefits, fixed asset write-downs, asset impairments and accelerated depreciation and may be material to our financial statements.

See also "Results of Operations" for further discussion of other significant items affecting operating costs.

Employees

As of December 31, 2016, we had approximately 3,700 full-time and part-time employees worldwide compared to approximately 3,800 (excluding AFI) as of December 31, 2015. Effective April 1, 2016, approximately 3,900 of our former employees were employed by AFI as a result of the separation. Collective bargaining agreements covering approximately 300 employees at two U.S. plants will expire during 2017.

During the fourth quarter of 2016, we idled one of our plants in China. As a result, we expect a reduction of approximately 190 employees in China in the first quarter of 2017. We believe that our relations with our employees are satisfactory.

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 pension and postretirement plans throughout the world, with the most significant plans located 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.

Effective December 31, 2016, we elected to measure the U.S. pension plans' and U.S. postretirement plan's benefit obligations by applying spot rates along the yield curve to the relevant projected cash flows, as we believe this provides a better measurement of these costs. This change in methodology requires management to utilize different discount rates to measure service cost and interest cost. We have accounted for this change in discount rate methodology as a change in accounting estimate and, accordingly have applied it on a prospective basis. This change did not affect the measurement of the total benefit obligation.

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

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, 2016 and 2015, we assumed discount rates of 4.12% and 4.40%, respectively, for the U.S. defined benefit pension plans. As of December 31, 2016 and 2015, we assumed a discount rates of 4.10% and 4.25%, 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 2017 operating income.

We manage two U.S. defined benefit pension plans, a qualified funded plan and a nonqualified unfunded plan. For the qualified funded plan, 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, 2016, the historical annualized return was approximately 5.4% compared to an average expected return of 7.3%. The actual gain on plan assets achieved for 2016 was 9.2%. 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 2016 U.S. pension cost was 6.75%. We have assumed a return on plan assets for 2017 of 6.50%. The 2017 expected return on assets was calculated in a manner consistent with 2016. A one-quarter percentage point increase or decrease in this assumption would increase or decrease 2017 operating income by approximately \$3.8 million.

Contributions to the unfunded plan were \$4.2 million in 2016 and were made on a monthly basis to fund benefit payments. We estimate the 2017 contributions will be approximately \$3.9 million. See Note 16 to the Consolidated Financial Statements for more information.

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
2015	6.8 %	7.5 %	0.2 %	(10.3)%
2016	9.0 %	7.5 %	8.6 %	3.3 %
2017	8.5 %	7.3 %		

The difference between the actual and expected health care costs is amortized into earnings as described below. As of December 31, 2016, health care cost increases are estimated to decrease ratably until 2025, after which they are estimated to be constant at 4.5%. A one percentage point increase or decrease in the assumed health care cost trend

rate would not have a material impact on 2017 operating income. See Note 16 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. During 2016, as a result of certain thresholds being met, actuarial gains and losses were amortized into future earnings over the expected remaining service period of plan participants, which was approximately eight years for our U.S. pension plans and our U.S. postretirement plan. Beginning in 2017, actuarial gains and losses will be amortized over the remaining life expectancy of participants, which is estimated to be approximately 20 years for our U.S. pension plans and approximately 10 years for our U.S. postretirement plans. The 2017 change in amortization period for our U.S. pension plans results from active AFI participants leaving our plan, which correspondingly results in retirees representing a larger portion of our plan participants. Changes in assumptions could have significant effects on earnings in future years.

Excluding the impact of the separation of AFI, we recognized a decrease in net actuarial losses related to our U.S. pension benefit plans of \$81.8 million in 2016 primarily due to changes in actuarial assumptions (most significantly a 28 basis point decrease in the discount rate) and the amortization of net actuarial losses recorded as a component of 2016 net periodic pension cost. The \$81.8 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 (Loss) along with actuarial gains and losses from our foreign pension plans and our U.S. postretirement benefit plan.

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

Income Taxes – Our effective tax rate is primarily determined based on our pre-tax income and the statutory income tax rates in the jurisdictions in which we operate. The effective tax rate also reflects 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 loss (“NOL”) 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 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.

Our domestic FTC carryforward deferred tax asset as of December 31, 2016 was \$22.1 million on a gross basis (\$19.3 million when netted with unrecognized tax benefits). As of December 31, 2016, our valuation allowance for our domestic FTC carryforward deferred tax asset was \$0.8 million. We considered the following positive and negative evidence in assessing the need for a valuation allowance for our domestic FTC carryforward deferred tax asset:

Positive Evidence

- Under U.S. tax law, approximately \$10.2 million of our domestic source income in future years can be characterized as FSI to enable the utilization of our FTCs. This amount primarily represents prior year intercompany dividends associated with the FTC carryforwards. These dividends created domestic taxable income that was reduced by the utilization of domestic NOLs; and

• Forecasts of future profitability and FSI.

Negative Evidence

• Our stated position to permanently reinvest unremitted earnings of our foreign subsidiaries. The ability to fully utilize the FTC carryforwards may be affected by the following factors:

• FSI of \$63.1 million is needed to fully utilize the FTC carryforward of \$22.1 million before they expire in 2022. In addition to the \$10.2 million of domestic source income that can be characterized as FSI in future years, \$52.9 million of additional foreign source income is needed.

• The main factor that could result in our inability to re-characterize domestic source income to foreign source income is a U.S. tax law change.

• The main factors that could contribute to lower FSI are decreased export sales and increased allocable expenses.

As of December 31, 2016, we have recorded valuation allowances totaling \$60.5 million for various federal, state, and foreign 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 14 to the Consolidated Financial Statements, our Consolidated Balance Sheet as of December 31, 2016 includes net deferred income tax assets of \$159.1 million. Included in this amount are deferred federal income tax assets for FTC carryforwards of \$22.1 million, state NOL deferred income tax assets of \$32.0 million, and foreign NOL deferred tax assets of \$39.9 million. We have established valuation allowances in the amount of \$60.5 million consisting of \$0.8 million for federal deferred tax assets related to FTC carryovers, \$16.5 million for state deferred tax assets, primarily operating loss carryovers, and \$43.2 million for foreign deferred tax assets, primarily foreign operating loss carryovers.

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

Inherent in determining our effective tax rate are 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, earnings repatriation plans, and other future tax consequences.

We estimate we will need to generate future U.S. taxable income of approximately \$772.7 million for state income tax purposes during the respective realization periods (ranging from 2017 to 2036) in order to fully realize the net deferred income tax assets.

As previously disclosed in prior SEC filings, 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 and Intangible Assets** – Our indefinite-lived intangibles are primarily trademarks and brand names, which 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 test for non-amortizable intangible assets during the fourth quarter, although we conduct interim impairment tests if events or circumstances indicate the asset might be impaired. We conduct impairment tests for tangible assets and amortizable intangible assets when indicators of impairment exist, 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 assets. 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.

The principal assumption utilized in our impairment tests for definite-lived intangible assets is operating profit adjusted for depreciation and amortization. The principal assumptions utilized in our impairment tests for indefinite-lived intangible assets include revenue growth rate, discount rate and royalty rate. Revenue growth rate and operating profit assumptions are derived from those utilized in our operating plan and strategic planning processes. The discount rate assumption is calculated based upon an estimated weighted average cost of equity 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 reporting unit.

In 2016, indefinite-lived intangibles were tested for impairment based on our existing reporting units, which changed as a result of the separation of AFI and the subsequent change in our operating segments. No other methodologies used for valuing our intangible assets changed from prior periods.



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.

There were no material impairment charges recorded in 2016, 2015 or 2014 related to intangible assets.

We did not test tangible assets for impairment in 2016, 2015 or 2014 as no indicators of impairment existed.

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 10 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

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

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

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 4 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.

## 2016 COMPARED TO 2015

## CONSOLIDATED RESULTS FROM CONTINUING OPERATIONS

(dollar amounts in millions)

	2016	2015	Change is Favorable	
Total consolidated net sales	\$1,234.5	\$1,231.3	0.3	%
Operating income	\$184.6	\$140.5	31.4	%

Excluding the unfavorable impact of foreign exchange of \$22 million, consolidated net sales increased 2.0% due to favorable AUV of \$24 million and higher volumes of \$1 million.

Cost of goods sold was 69.9% of net sales in 2016, compared to 69.4% in 2015. The comparison was impacted by \$5 million of severance and other charges associated with the idling of a plant in China in 2016.

SG&A expenses in 2016 were \$225.2 million, or 18.2% of net sales, compared to \$267.7 million, or 21.7% of net sales, in 2015. The decrease was primarily the result the impact of the separation and cost control measures, particularly in international markets to offset soft market demand.

Separation costs of \$34.5 million in 2016, compared to \$34.3 million in 2015, were primarily related to outside professional services and employee compensation and severance accruals incurred in conjunction with our initiative to separate our flooring business from our ceilings business.

Equity earnings from our WAVE joint venture were \$73.1 million in 2016, compared to \$66.1 million in 2015. The increase was due to higher sales volumes, favorable AUV and lower manufacturing input costs, partially offset by higher SG&A expenses for go-to-market investments. See Note 9 to the Consolidated Financial Statements for further information.

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

Interest expense was \$49.8 million in 2016, compared to \$45.3 million in 2015. The increase in interest expense was due to \$10.7 million of losses that were reclassified from accumulated other comprehensive income to interest expense during the first quarter of 2016 as a result of the settlement of \$450.0 million of notional amount interest rate swaps which occurred in connection with the refinancing of our credit facilities, partially offset by lower costs due to a reduction in total debt outstanding and a lower interest rate spread and \$2.4 million of gains that were reclassified from accumulated other comprehensive income to interest expense during the fourth quarter of 2016 in connection with our entering into \$450.0 million of notional amount of basis rate swaps. See Note 15 to the Consolidated Financial Statements for details related to our debt refinancing and Note 18 to the Consolidated Financial Statements for details related to our interest rate swap transactions.

Other non-operating income was \$9.6 million in 2016 and \$5.0 million in 2015. The changes in other non-operating income were primarily due to foreign exchange rate gains on the translation of unhedged cross-currency intercompany loans.

Other non-operating expenses were \$0.1 million in 2016, compared to \$20.1 million in 2015. Expenses in 2015 were primarily due to foreign exchange rate losses on the translation of unhedged cross-currency intercompany loans denominated in Russian rubles, related to the construction of our Russian mineral fiber ceiling plant that was completed in the first quarter of 2015. During the fourth quarter of 2016, all Russian ruble denominated intercompany loans were settled with intercompany capital contributions. Where efficient, reliable and liquid markets exist we may utilize foreign currency forward exchange contracts to hedge exposures created by cross-currency intercompany loans and dividends. Our largest unhedged foreign currency exposures are in Chinese renminbi and Russian rubles.

Income tax expense was \$50.4 million and \$53.5 million in 2016 and 2015, respectively. The effective tax rate for 2016 was 34.9% as compared to a rate of 66.8% for 2015. The effective tax rate for 2016 was lower than 2015 primarily due to income tax benefits recorded during the second half of 2016 resulting from the reversal of reserves for uncertain tax positions as a result of an expiration of the federal statute of limitations to review previously filed income tax returns and a benefit resulting from the write-off of the historical tax basis of one of our foreign subsidiaries.

Total other comprehensive income ("OCI") was \$23.6 million for 2016 compared to \$8.1 million for 2015. Foreign currency translation adjustments represent the change in the U.S. dollar value of assets and liabilities denominated in foreign currencies. Foreign currency losses in 2016 were driven primarily by changes in the exchange rate of the British pound, the Chinese renminbi, partially offset by gains in the Russian ruble. 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. Derivative gains in 2016 were primarily due to the mark to market changes related to interest rate swaps and our natural gas hedges, partially offset by losses on our foreign currency hedges. Gains on interest rate hedges were partially offset by \$8.3 million of net losses related to settlements of interest rates swaps in 2016. Pension and postretirement adjustments represent actuarial gains and losses related to our defined-benefit pension and postretirement plans with gains in 2016 primarily related to our U.S. pension plans.

## REPORTABLE SEGMENT RESULTS

### Americas

(dollar amounts in millions)

	2016	2015	Change is Favorable/ (Unfavorable)	
Total segment net sales	\$837.3	\$805.1	4.0	%
Operating income	\$232.1	\$283.5	(18.1	)%

Excluding the unfavorable impact of foreign exchange of \$2 million, net sales in the Americas increased 4.3% due to higher volumes of \$20 million and favorable AUV of \$15 million.

Operating income decreased as higher earnings from WAVE of \$7 million, the favorable margin impact of higher volumes of \$5 million, and the favorable margin impact of higher AUV of \$5 million were more than offset by higher SG&A expenses of \$54 million and higher manufacturing and input costs of \$14 million. The increase in SG&A expenses in 2016 was primarily a result of the inclusion of costs formally assigned to our Corporate Unallocated segment, partially offset by a reduction in costs primarily due to the separation. The increase in manufacturing costs was impacted by investments in our manufacturing footprint to expand and enhance our capabilities to produce high end products.

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

## EMEA

(dollar amounts in millions)

	2016	2015	Change is Favorable/ (Unfavorable)	
Total segment net sales	\$263.1	\$289.9	(9.2	)%
Operating (loss)	\$(8.2 )	\$(11.9 )	31.1	%

Excluding the unfavorable impact of foreign exchange of \$15 million, net sales in the EMEA markets decreased 4.0% due to lower volumes of \$17 million which were only partially offset by favorable AUV of \$6 million. The decline in volumes was driven by the Middle East and to a lesser extent the United Kingdom.

Operating loss decreased driven by lower SG&A expenses of \$9 million and lower manufacturing and input costs of \$3 million, which was mostly offset by the margin impact of lower volumes of \$6 million and the margin impact of unfavorable AUV of \$4 million. The comparison was also impacted by \$2 million of severance costs associated with cost reduction actions in 2015.

## Pacific Rim

(dollar amounts in millions)

	2016	2015	Change is Favorable/ (Unfavorable)	
Total segment net sales	\$134.1	\$136.3	(1.6	)%
Operating (loss)	\$(0.5 )	\$(6.8 )	92.6	%

Excluding the unfavorable impact of foreign exchange of \$4 million, net sales in the Pacific Rim increased 1.5% due to higher AUV of \$4 million partially offset by lower volumes of \$2 million. Sales volumes in Australia and China grew in comparison to the prior year while India sales softened.

Operating loss decreased driven by the margin impact of favorable AUV of \$3 million, lower manufacturing and input costs of \$2 million and lower SG&A expense of \$1 million. The comparison was also impacted by \$5 million and \$3 million of severance and other charges associated with the idling of a plant in China during 2016 and 2015, respectively.

## Unallocated Corporate

Unallocated corporate expense of \$38.8 million decreased from \$124.3 million in the prior year. The decrease was due to the inclusion of most of the Corporate functions within the Americas segment as a result of the separation.

## FINANCIAL CONDITION AND LIQUIDITY

### Cash Flow

The discussion that follows includes cash flows related to discontinued operations.

Operating activities for 2016 provided \$49.3 million of cash, compared to \$203.7 million of cash provided in 2015. The decrease was primarily due to change in working capital, most notably a decrease accounts payable and accrued expenses related to the separation of AFI. The decrease due to the change in working capital was partially offset by higher cash earnings partially offset by a reduction in depreciation and amortization.

Net cash used for investing activities was \$17.0 million in 2016, compared to \$101.5 million in 2015. The change in investing activities cash flows was primarily due to decreased purchases of property, plant and equipment, partially offset by higher dividends from our WAVE joint venture.

Net cash used by financing activities was \$128.9 million in 2016, compared to \$32.3 million in 2015. The unfavorable use of cash was primarily the result of higher payments of debt and repurchase of outstanding common stock.

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

## 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.

On April 1, 2016, we refinanced our \$1,275.0 million senior credit facility, utilizing a \$50.0 million cash dividend from AFI and cash on hand to pay down a portion of the debt outstanding. The \$1,050.0 million new credit facility is composed of a \$200.0 million revolving credit facility (with a \$150.0 million sublimit for letters of credit), a \$600.0 million Term Loan A and a \$250.0 million Term Loan B. The terms of the credit facility resulted in a lower interest rate spread for both the revolving credit facility and Term Loan A (2.00% vs. 2.50%) and a higher spread for Term Loan B (3.25% vs. 2.50%). In addition, we lowered the interest rate floor on the Term Loan B from 1.00% to 0.75%. We also extended the maturity of both the revolving credit facility and Term Loan A from March 2018 to April 2021 and of Term Loan B from November 2020 to April 2023. This \$1,050.0 million senior credit facility is secured by U.S. personal property, the capital stock of material U.S. subsidiaries and a pledge of 65% of the stock of our material first tier foreign subsidiaries. Finally, in April 2016, we established a \$25.0 million letter of credit facility with the Bank of Nova Scotia, also known as our bi-lateral facility.

As of December 31, 2016, total borrowing outstanding under our senior credit facility were \$600.0 million under Term Loan A and \$248.1 million under Term Loan B. There were no borrowings outstanding under the revolving credit facility or the bi-lateral facility.

Under our refinanced senior credit facility we are subject to year-end leverage tests that may trigger mandatory prepayments. If our ratio of consolidated funded indebtedness minus AWI and domestic subsidiary unrestricted cash and cash equivalents up to \$100 million to consolidated earnings before interest, taxes, depreciation and amortization ("EBITDA") ("Consolidated Net Leverage Ratio") is greater than 3.5 to 1.0, the prepayment amount would be based on a computation of 50% of Consolidated Excess Cash Flow, as defined by the credit agreement. These annual payments would be made in the first quarter of the following year. No payment will be required in 2017.

The refinanced senior credit facility includes two financial covenants that require the ratio of consolidated 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 Consolidated Net Leverage Ratio to be less than or equal to 3.75 to 1.0. As of December 31, 2016, we were in compliance with all covenants of the senior credit facility.

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

Notional			
Trade Date	Amount	Coverage Period	Risk Coverage
November 13, 2016	\$ 250.0	November 2016 to March 2018	Term Loan A
November 13, 2016	\$ 200.0	November 2016 to March 2021	Term Loan A
April 1, 2016	\$ 100.0	April 2016 to March 2023	Term Loan B



These swaps are designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt. The unpaid balances of Term Loan A, the Revolving Credit Facility and Term Loan B may be prepaid without penalty at the maturity of their respective interest reset periods. Any amounts prepaid on the Term Loan A or Term Loan B may not be re-borrowed.

In connection with the refinancing of our credit facilities in April 2016, \$450.0 million of notional amount Term Loan B swaps with a trade date of March 27, 2012 were settled and \$10.7 million of losses previously recorded as a component of accumulated other comprehensive income were reclassified to interest expense in 2016.

As of December 31, 2015, we had a \$250.0 million notional Term A swap with a trade date of April 16, 2013 and a maturity date of March 2018, in which we received 3-month LIBOR and paid a fixed rate over the hedged period. On April 1, 2016, we entered into an additional \$200.0 million notional amount Term Loan A swap with a maturity date of March 2021, in which we also received 3-month LIBOR and paid a fixed rate over the hedged period, collectively resulting in \$450.0 million notional Term Loan A interest rate swaps (the "Term Loan A Swaps").

During the fourth quarter of 2016, we elected to change the basis for interest payments due under our Term Loan A from 3-month LIBOR to 1-month LIBOR. In connection with the change in our underlying interest payments, in November 2016 we entered into \$450.0 million forward-starting notional amount basis rate swaps to convert the floating rate risk under our Term Loan A Swaps from 3-month LIBOR to 1-month LIBOR and jointly designated the basis swaps with our Term Loan A Swaps in cash flow hedging

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

relationships. As a result of this transaction, \$2.4 million of gains previously recorded as a component of accumulated other comprehensive income were reclassified as a reduction to interest expense during the fourth quarter of 2016. Since the basis rate swaps had a non-zero fair value upon designation as cash flow hedges, mark-to-market gains or losses on ineffective portions of these hedges will be recorded as a component of interest expense.

Also on April 1, 2016, we entered into a \$100.0 million notional Term Loan B swap in which we receive the greater of 3-month LIBOR or a 0.75% LIBOR Floor and pay a fixed rate over the hedged period.

As of December 31, 2016 our outstanding long-term debt included a \$35.0 million variable rate, tax-exempt industrial development bond that financed the construction of a plant in prior years. This bond has a scheduled final maturity of 2041 and is remarketed by an agent on a regular basis at a market-clearing interest rate. Any portion of the bond that is not successfully remarketed by the agent are required to be repurchased. This bond is backed by letters of credit which will be drawn if a portion of the bond is not successfully remarketed. We have not had to repurchase the bond.

Our foreign subsidiaries had available lines of credit totaling \$4.1 million as of December 31, 2016. These lines of credit are uncommitted, and poor operating results or credit concerns at the related foreign subsidiaries could result in the lines being withdrawn by the lenders. We have historically been able to maintain and, as needed, replace credit facilities to support our non-U.S. operations. As of December 31, 2016 we had no borrowings under these lines of credit.

As of December 31, 2016, we had \$141.9 million of cash and cash equivalents, \$86.8 million in various foreign jurisdictions and \$55.1 million in the U.S.

In February 2017, we repriced the interest rate of our \$248.1 million Term Loan B borrowing, resulting in a lower LIBOR spread (2.75% vs. 3.25%). The maturity date remained unchanged along with all other terms and conditions. In connection with the repricing we paid \$0.6 million of bank, legal and other fees, the majority of which were capitalized.

In March 2016, we amended and decreased our \$100.0 million Accounts Receivable Securitization Facility with the Bank of Nova Scotia (the "funding entity") to \$40.0 million to reflect a lower anticipated receivables balance in connection with the separation of AFI, and we extended the maturity date from December 2017 to March 2019. Under our Accounts Receivable Securitization 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 LLC 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. As of December 31, 2016 we had no borrowings under this facility.

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. In addition, our foreign subsidiaries' available lines of credit are available for letters of credit and guarantees. Letters of credit are 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):

Financing Arrangement	As of December 31, 2016		
	Limit	Used	Available
Revolving credit facility	\$150.0	\$-	\$ 150.0
Bi-lateral facility	25.0	19.2	5.8
Accounts receivable securitization facility	32.2	36.2	(4.0 )
Foreign lines of credit	0.2	0.1	0.1
Total	\$207.4	\$55.5	\$ 151.9

As of December 31, 2016, \$4.0 million of letters of credits issued under our accounts receivable securitization facility in excess of our maximum limit were classified as restricted cash and reported as a component of Cash and cash equivalents on our Consolidated Balance Sheets. This restriction will lapse upon replacement of collateral with accounts receivables and/or upon a change in the letter of credit limit as a result of higher securitized accounts receivable balances.

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

We believe that cash on hand and cash generated from operations, together with lines of credit, availability under our securitization facility and the 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.

## 2015 COMPARED TO 2014

## CONSOLIDATED RESULTS FROM CONTINUING OPERATIONS

(dollar amounts in millions)

	2015	2014	Change is (Unfavorable)
Total consolidated net sales	\$1,231.3	\$1,294.3	(4.9)%
Operating income	\$140.5	\$198.1	(29.1)%

Excluding the unfavorable impact of foreign exchange of \$76 million, consolidated net sales for 2015 increased 1.0% due to favorable AUV of \$48 million, partially offset by lower volumes of \$35 million.

Cost of goods sold was 69.4% of net sales in 2015, compared to 70.4% in 2014. Compared to the prior year, the reduction was caused by lower input costs, partially offset by higher manufacturing and U.S. pension costs.

SG&A expenses in 2015 were \$267.7 million, or 21.7% of net sales, compared to \$250.1 million, or 19.3% of net sales in 2014. The increase was primarily due to an increase in go-to-market investments in the Americas and an increase in U.S. pension costs. See Reportable Segment Results for additional information.

Separation costs of \$34.3 million in 2015 were primarily related to outside professional services and employee retention and severance accruals incurred in conjunction with our initiative to separate our flooring business from our ceilings business.

Equity earnings from our WAVE joint venture were \$66.1 million in 2015, compared to \$65.1 million in 2014.

Interest expense was \$45.3 million in 2015, compared to \$46.0 million in 2014.

Income tax expense was \$53.5 million and \$69.3 million in 2015 and 2014, respectively. The effective tax rate for 2015 was 66.8% as compared to a rate of 46.7% for 2014. The effective tax rate for 2015 was higher than 2014 primarily due to lower pre-tax income causing a higher rate of unbenefited foreign operating losses, non-deductible separation costs, a decrease in research and development tax credits as 2014 included the benefit of multiple years of such credits and state net operating loss write-offs resulting from a change in ownership under Section 382 of the Internal Revenue Code.

## REPORTABLE SEGMENT RESULTS

## Americas

(dollar amounts in millions)

	2015	2014	Change is	
			Favorable	
Total segment net sales	\$805.1	\$798.3	0.9	%
Operating income	\$283.5	\$272.1	4.2	%

Excluding the unfavorable impact of foreign exchange of \$9 million, net sales in the Americas increased 2.0% due to favorable AUV of \$26 million, partially offset by lower volumes of \$10 million.

Operating income increased primarily due to the margin impact of favorable AUV of \$19 million, lower manufacturing and input costs of \$10 million and higher earnings from WAVE of \$2 million, partially offset by the margin impact of lower volumes of \$11 million and higher SG&A expenses of \$7 million.

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

## EMEA

(dollar amounts in millions)

	2015	2014	Change is (Unfavorable)
Total segment net sales	\$289.9	\$353.4	(18.0)%
Operating (loss)	\$(11.9)	\$(5.4)	Unfavorable

Excluding the unfavorable impact of foreign exchange of \$58 million, net sales in EMEA decreased 1.7% due to lower volumes of \$21 million, partially offset by favorable AUV of \$16 million.

Operating loss increased primarily due to the margin impact of lower volumes of \$10 million, an increase in manufacturing and input costs of \$8 million, due primarily to start-up costs associated with our Russian mineral fiber plant and \$2 million higher severance charges in 2015 for cost reduction actions. Partially offsetting these increases in operating loss was the margin impact of favorable AUV of \$8 million and lower SG&A expense of \$7 million.

## Pacific Rim

(dollar amounts in millions)

	2015	2014	Change is (Unfavorable)
Total segment net sales	\$136.3	\$142.6	(4.4)%
Operating (loss)	\$(6.8)	\$(2.0)	Unfavorable

Excluding the unfavorable impact of foreign exchange of \$10 million, net sales in the Pacific Rim increased 2.2% due to favorable AUV of \$7 million, partially offset by lower volumes of \$4 million.

Operating loss increased primarily due to \$5 million of severance and other charges in 2015 related to our decision to idle one of our plants in China.

## Unallocated Corporate

Unallocated corporate expense of \$124.3 million increased from \$66.6 million in the prior year, due to separation costs of \$34 million recorded in 2015 and higher U.S. pension costs of \$17 million and a \$4 million increase in environmental reserves related to our Macon, Georgia facility.

## Cash Flow

The discussion that follows includes cash flows related to discontinued operations.

Operating activities for 2015 provided \$203.7 million of cash, compared to \$208.8 million of cash provided in 2014. Lower cash earnings in 2015 were partially offset by favorable changes in working capital, primarily due to favorable timing of accounts payable and accrued expenses.

Net cash used for investing activities was \$101.5 million for 2015, compared to \$149.3 million in 2014. This change was primarily due to decreased purchases of property, plant and equipment.

Net cash used by financing activities was \$32.3 million for 2015, compared to \$3.3 million provided during 2014. Net cash used in 2015 was primarily driven by payments on long-term debt. Net cash provided in 2014 was driven by proceeds from exercised stock options and excess tax benefits from share-based awards, partially offset by payments of long-term debt.

#### OFF-BALANCE SHEET ARRANGEMENTS

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

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

## 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, 2016. 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.

(dollar amounts in millions)	2017	2018	2019	2020	2021	Thereafter	Total
Long-term debt <sup>(1)</sup>	\$25.0	\$32.5	\$55.0	\$62.5	\$437.5	\$ 270.6	\$883.1
Scheduled interest payments <sup>(2)</sup>	32.3	33.0	34.1	33.0	18.5	34.1	185.0
Operating lease obligations, net of sublease income <sup>(3)</sup>	7.3	5.9	4.5	3.1	2.4	2.4	25.6
Unconditional purchase obligations <sup>(4)</sup>	78.1	49.3	1.8	0.5	0.3	0.7	130.7
Pension contributions <sup>(5)</sup>	6.6	-	-	-	-	-	6.6
Other obligations <sup>(6), (7)</sup>	6.0	-	-	-	-	-	6.0
<b>Total contractual obligations</b>	<b>\$155.3</b>	<b>\$120.7</b>	<b>\$95.4</b>	<b>\$99.1</b>	<b>\$458.7</b>	<b>\$ 307.8</b>	<b>\$1,237.0</b>

<sup>(1)</sup>Excludes \$9.5 million of unamortized debt financing costs as of December 31, 2016.

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

<sup>(3)</sup>Lease obligations include the minimum payments due under existing agreements with non-cancelable lease terms in excess of one year.

<sup>(4)</sup>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.

<sup>(5)</sup> Pension contributions include estimated contributions for our defined benefit pension plans. We are not presenting estimated payments in the table above beyond 2017 as funding can vary significantly from year to year based upon changes in the fair value of plan assets, funding regulations and actuarial assumptions.

<sup>(6)</sup>Other obligations include payments under severance agreements.

<sup>(7)</sup>Other obligations, does not include \$86.9 million of 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 14 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 2016 was \$8.3 million. See Note 16 to the Consolidated Financial Statements for additional information regarding future expected cash payments for postretirement benefits.



We are party to supply agreements, some of which require the purchase of inventory remaining at the supplier upon termination of the agreement. Had these agreements terminated at December 31, 2016, we would have been obligated to purchase approximately \$0.9 million of inventory. Historically, due to production planning, we have not had to purchase material amounts of product at the end of similar contracts. Accordingly, no liability has been recorded for these guarantees.

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

Letters of credit are currently arranged through our revolving credit facility, our bi-lateral facility and our securitization facility. In addition, our foreign subsidiaries' available lines of credit are available for letters of credit and guarantees. Letters of credit are 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, 2016.

Other Commercial Commitments	Total	Less			
		Than	1 – 3	4 – 5	Over
(dollar amounts in millions)	Amounts	1	1 – 3	4 – 5	5
	Committed	Year	Years	Years	Years
Letters of credit	\$ 55.5	\$55.5	\$ -	\$ -	\$ -

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, 2016, we had no liabilities recorded for which an indemnity claim had been received.

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

## Market Risk

We are exposed to market risk from changes in foreign currency exchange rates, interest rates and commodity prices that could impact our results of operations, cash flows and financial condition. We use forward swaps and option contracts to hedge these exposures, which are entered into for periods consistent with underlying exposure and do not constitute positions independent of those exposures. We use 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.

## Counterparty Risk

We only enter into derivative transactions with established counterparties having an investment grade or better. 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 receive cash collateral with any counterparty for our derivative transactions. As of December 31, 2016 we had no cash collateral posted or received for any of our derivative transactions. These ISDAs do not contain any credit contingent features other than those contained in our bank credit facility. Exposure to individual counterparties is controlled, and thus 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, Term Loan B, revolving credit facility and other borrowings. A hypothetical increase of one-quarter percentage point in LIBOR interest rates from December 31, 2016 levels would increase 2017 interest expense by approximately \$0.8 million. As of December 31, 2016, \$248.1 million of our debt has a 0.75% LIBOR floor which would not be affected by a one-quarter percentage point move in LIBOR given the current interest rate environment. We also have \$550.0 million of interest rate swaps outstanding, which fix the interest rates for a portion of our debt. The current portion of the interest rate swaps is included in this calculation.

As of December 31, 2016, we had interest rate swaps outstanding on Term Loan A and on Term Loan B, with notional amounts of \$450.0 million and \$100.0 million, respectively. 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. Under the terms of our Term Loan B, we receive the greater of 3-month LIBOR or a 0.75% LIBOR Floor and pay a fixed rate over the hedged period. The following table summarizes our interest rate swaps as of December 31, 2016 (dollar amounts in millions):

	Notional			
Trade Date	Amount	Coverage Period		Risk Coverage
November 13, 2016	\$ 250.0	November 2016 to March 2018		Term Loan A
November 13, 2016	\$ 200.0	November 2016 to March 2021		Term Loan A
April 1, 2016	\$ 100.0	April 2016 to March 2023		Term Loan B

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These swaps are designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt. The net asset measured at fair value was \$6.9 million at December 31, 2016.

The table below provides information about our long-term debt obligations as of December 31, 2016, 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.

Scheduled maturity date							After	
(dollar amounts in millions)	2017	2018	2019	2020	2021	2021	Total	
Variable rate principal								
payments	\$25.0	\$32.5	\$55.0	\$62.5	\$437.5	\$270.6	\$883.1	
Average interest rate	3.31 %	3.78 %	4.05 %	4.20 %	4.31 %	3.66 %	4.04 %	

Variable rate principle payments reflected in the preceding table exclude \$9.5 million of unamortized debt financing costs as of December 31, 2016.

### Exchange Rate Sensitivity

We manufacture and sell our products in a number of countries throughout the world and, as a result, are exposed to movements in foreign currency exchange rates. To a large extent, our global manufacturing and sales provide a natural hedge of foreign currency exchange rate movement. We use foreign currency forward exchange contracts to reduce our remaining exposure. As of December 31, 2016, our major foreign currency exposures are to the Chinese renminbi, Russian ruble, Euro and Canadian dollar. A 10% strengthening of all currencies against the U.S. dollar compared to December 31, 2016 levels would increase our 2017 earnings before income taxes by approximately \$8.5 million, including the impact of current foreign currency forward exchange contracts.

We also may use foreign currency forward exchange contracts to hedge exposures created by cross-currency intercompany loans.

The table below details our outstanding currency instruments as of December 31, 2016.

On balance sheet foreign exchange related derivatives			
(dollar amounts in millions)	Maturing in 2017	Maturing in 2018	Total
Notional amounts	\$ 27.5	\$ 7.1	\$34.6
Assets at fair value	1.4	0.2	1.6

### Natural Gas Price Sensitivity

We purchase natural gas for use in the manufacturing process and to heat many of our facilities. As a result, we are exposed to fluctuations in the price of natural gas. We have a policy of reducing North American natural gas volatility through derivative instruments, including forward contracts and swaps, purchased call options, and zero-cost collars up to 24 months forward. As of December 31, 2016, we had contracts to hedge approximately \$7.4 million (notional amounts) of natural gas. All of these contracts mature by November 2017. A 10% increase in North American natural gas prices compared to December 31, 2016 prices would increase our 2017 expenses by approximately \$0.8 million including the impact of current hedging contracts. As of December 31, 2016 we had recorded net assets of \$1.0 million related to these contracts.

ITEM 8. FINANCIAL STATEMENTS AND  
SUPPLEMENTARY DATA  
SUPPLEMENTARY DATA

Quarterly Financial Information for the Years Ended December 31, 2016 and 2015 (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 (Loss) for the Years Ended December 31, 2016, 2015 and 2014.

Consolidated Balance Sheets as of December 31, 2016 and 2015.

Consolidated Statements of Equity for the Years Ended December 31, 2016, 2015 and 2014.

Consolidated Statements of Cash Flows for the Years Ended December 31, 2016, 2015 and 2014.

Notes to Consolidated Financial Statements.

Schedule II for the Years Ended December 31, 2016, 2015 and 2014.

## Armstrong World Industries, Inc., and Subsidiaries

## Quarterly Financial Information (unaudited)

(dollar amounts in millions, except for per share data)

	First	Second	Third	Fourth
<b>2016</b>				
Net sales	\$287.4	\$314.3	\$334.9	\$297.9
Gross profit	84.3	91.5	109.7	85.7
(Loss) earnings from continuing operations	(7.1 )	16.6	55.9	28.5
Per share of common stock:				
Basic	\$(0.13 )	\$0.30	\$1.00	\$0.52
Diluted	\$(0.13 )	\$0.29	\$0.99	\$0.51
Price range of common stock - high	\$48.66	\$48.39	\$45.75	\$45.00
Price range of common stock - low	\$35.92	\$36.33	\$37.49	\$36.38
<b>2015</b>				
Net sales	\$292.0	\$306.1	\$335.9	\$297.3
Gross profit	89.1	91.5	111.1	84.7
Earnings (loss) from continuing operations	5.7	15.1	19.7	(13.9 )
Per share of common stock:				
Basic	\$0.10	\$0.27	\$0.35	\$(0.25 )
Diluted	\$0.10	\$0.27	\$0.35	\$(0.25 )
Price range of common stock - high	\$58.42	\$58.96	\$60.70	\$52.33
Price range of common stock - low	\$48.60	\$52.94	\$46.47	\$44.43

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. Historical stock prices above have not been restated as a result of the separation of AFI.

Armstrong World Industries, Inc., and Subsidiaries

Quarterly Financial Information (unaudited)

(dollar amounts in millions, except for per share data)

Fourth Quarter 2016 Compared With Fourth Quarter 2015 – Continuing Operations

Excluding the unfavorable impact of foreign exchange of \$4 million, consolidated net sales for the fourth quarter of 2016 increased 1.5% due to favorable AUV of \$13 million, partially offset by lower volumes of \$9 million.

Americas net sales increased 3.6% due to favorable AUV of \$8 million. Excluding the unfavorable impact of foreign exchange of \$4 million, EMEA net sales decreased by 7.4% due to lower volumes of \$11 million, partially offset by favorable AUV of \$5 million. Pacific Rim net sales increased 7.7% due to higher volumes of \$3 million.

For the fourth quarter of 2016, cost of goods sold was 71.2% of net sales, compared to 71.5% in 2015. During the fourth quarter of 2015, we incurred approximately \$5 million and \$4 million in cost of goods sold and selling, general and administrative (“SG&A”) expenses, respectively, associated with cost reduction actions in EMEA and our decision to idle one of our Building Products plants in China.

SG&A expenses for the fourth quarter of 2016 were \$60.0 million, or 20.1% of net sales compared to \$77.8 million, or 26.2% of net sales, for the fourth quarter of 2015. The reduction in SG&A was due to the net impact of the separation and cost control measures, particularly in international markets to offset market demand.

In the fourth quarter of 2016, we recorded \$1.5 million of separation costs, compared to \$17.5 million of separation costs in the fourth quarter of 2015. Separation costs primarily related to outside professional services and employee retention and severance accruals incurred in connection with our initiative to separate our flooring business from our ceilings business.

Equity earnings in the fourth quarters of 2016 and 2015 were \$16.1 million and \$16.5 million, respectively.

Operating income was \$40.3 million in the fourth quarter of 2016 compared to \$5.9 million in the fourth quarter of 2015, with the increase due primarily to a decrease in separation costs and SG&A expenses.

Interest expense in the fourth quarter of 2016 decreased to \$6.4 million compared to \$11.4 million in the fourth quarter of 2015 primarily due to the April 2016 refinancing of our credit facilities, which resulted in a reduction in total debt outstanding and a lower interest rate spread. In addition, during the fourth quarter, we realized \$2.4 million of gains on interest rate swaps which was recorded as a reduction to interest expense.

Fourth quarter income tax expense was \$6.0 million on pre-tax net income of \$34.5 million in 2016 compared to income tax expense of \$1.4 million on a pre-tax loss of \$12.5 million in 2015. Excluding the impact of the increase in pre-tax earnings, the effective tax rate for the fourth quarter of 2016 was lower in comparison to the same period in 2015 due to an income tax benefit recorded during the fourth quarter of 2016 resulting from the write-off of the historical tax basis of one of our foreign subsidiaries.



## 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, 2016.

KPMG LLP, an independent registered public accounting firm, audited our internal control over financial reporting as of December 31, 2016, 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 27, 2017

Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders

Armstrong World Industries, Inc.:

We have audited Armstrong World Industries, Inc. and subsidiaries' ("the Company") internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). 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 conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, 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.

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.

In our opinion, Armstrong World Industries, Inc. and subsidiaries maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of the Company as of December 31, 2016 and 2015, and the related consolidated statements of earnings and comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2016, and our report dated February 27, 2017 expressed an unqualified opinion on those consolidated financial statements.

/s/ KPMG LLP

Philadelphia, Pennsylvania

February 27, 2017

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders

Armstrong World Industries, Inc.:

We have audited the accompanying consolidated balance sheets of Armstrong World Industries, Inc. and subsidiaries (“the Company”) as of December 31, 2016 and 2015, and the related consolidated statements of earnings and comprehensive income (loss), equity and cash flows for each of the years in the three-year period ended December 31, 2016. In connection with our audits of the consolidated financial statements, we also have audited the financial statement schedule of valuation and qualifying reserves. These consolidated financial statements and financial statement schedule are the responsibility of the Company’s management. Our responsibility is to express an opinion on these consolidated financial statements and financial statement schedule based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Armstrong World Industries, Inc. and subsidiaries as of December 31, 2016 and 2015, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the related financial statement schedule, when considered in relation to the basic consolidated financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the Company’s internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), and our report dated February 27, 2017 expressed an unqualified opinion on the effectiveness of the Company’s internal control over financial reporting.

/s/ KPMG LLP

Philadelphia, Pennsylvania

February 27, 2017

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## Armstrong World Industries, Inc., and Subsidiaries

## Consolidated Statements of Earnings and Comprehensive Income (Loss)

(amounts in millions, except per share data)

	Years Ended December 31,		
	2016	2015	2014
Net sales	\$1,234.5	\$1,231.3	\$1,294.3
Cost of goods sold	863.3	854.9	911.2
Gross profit	371.2	376.4	383.1
Selling, general and administrative expenses	225.2	267.7	250.1
Separation costs	34.5	34.3	-
Equity earnings from joint venture	(73.1 )	(66.1 )	(65.1 )
Operating income	184.6	140.5	198.1
Interest expense	49.8	45.3	46.0
Other non-operating expense	0.1	20.1	5.9
Other non-operating (income)	(9.6 )	(5.0 )	(2.2 )
Earnings from continuing operations before income taxes	144.3	80.1	148.4
Income tax expense	50.4	53.5	69.3
Earnings from continuing operations	93.9	26.6	79.1
Net (loss) gain from discontinued operations, net of tax expense of			
\$0.1, \$17.8 and \$13.9	(4.5 )	26.0	(0.8 )
Gain (loss) on disposal of discontinued business, net of tax (benefit)			
of (\$15.2), (\$41.8) and (\$2.5)	15.3	41.6	(14.5 )
Net gain (loss) from discontinued operations	10.8	67.6	(15.3 )
Net earnings	\$104.7	\$94.2	\$63.8
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	(33.2 )	(25.5 )	(29.6 )
Derivative gain (loss)	7.5	0.7	(3.3 )
Pension and postretirement adjustments	49.3	32.9	(91.0 )
Total other comprehensive income (loss)	23.6	8.1	(123.9 )
Total comprehensive income (loss)	\$128.3	\$102.3	\$(60.1 )
Earnings per share of common stock, continuing operations:			
Basic	\$1.69	\$0.48	\$1.43
Diluted	\$1.68	\$0.47	\$1.42
Earnings (loss) per share of common stock, discontinued operations:			
Basic	\$0.19	\$1.21	\$(0.28 )
Diluted	\$0.19	\$1.21	\$(0.28 )
Net earnings per share of common stock:			
Basic	\$1.88	\$1.69	\$1.15
Diluted	\$1.87	\$1.68	\$1.14
Average number of common shares outstanding:			
Basic	55.4	55.5	55.0
Diluted	55.7	55.9	55.4

See accompanying notes to consolidated financial statements beginning on page 44.

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## Armstrong World Industries, Inc., and Subsidiaries

## Consolidated Balance Sheets

(amounts in millions, except share data)

	December 31, 2016	December 31, 2015
<b>Assets</b>		
<b>Current assets:</b>		
Cash and cash equivalents	\$ 141.9	\$ 209.3
Accounts and notes receivable, net	108.3	114.3
Inventories, net	109.0	101.4
Current assets of discontinued operations	-	381.2
Deferred income taxes	-	29.8
Income tax receivable	26.2	11.1
Other current assets	20.8	33.7
<b>Total current assets</b>	<b>406.2</b>	<b>880.8</b>
Property, plant, and equipment, less accumulated depreciation and amortization of \$445.5 and \$403.8, respectively	669.6	648.1
Prepaid pension costs	56.6	8.3
Investment in joint venture	106.2	130.8
Intangible assets, net	433.4	447.2
Noncurrent assets of discontinued operations	-	493.1
Deferred income taxes	15.4	19.5
Income tax receivable	5.7	2.4
Other noncurrent assets	64.9	57.0
<b>Total assets</b>	<b>\$ 1,758.0</b>	<b>\$ 2,687.2</b>
<b>Liabilities and Shareholders' Equity</b>		
<b>Current liabilities:</b>		
Current installments of long-term debt	\$ 25.0	\$ 52.1
Accounts payable and accrued expenses	197.1	231.1
Liabilities of discontinued operations	-	149.3
Income tax payable	2.0	3.2
Deferred income taxes	-	0.6
<b>Total current liabilities</b>	<b>224.1</b>	<b>436.3</b>
Long-term debt, less current installments	848.6	936.2
Postretirement benefit liabilities	84.8	87.2
Pension benefit liabilities	86.3	62.1
Other long-term liabilities	29.1	43.3
Noncurrent liabilities of discontinued operations	-	154.3
Income tax payable	62.2	92.3
Deferred income taxes	156.5	106.7
<b>Total noncurrent liabilities</b>	<b>1,267.5</b>	<b>1,482.1</b>
<b>Shareholders' equity:</b>		
Common stock, \$0.01 par value per share, authorized 200 million shares; issued	0.6	0.6

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60,597,140 shares, outstanding 54,428,233 shares in 2016 and 60,416,446		
shares issued, 55,359,064 outstanding shares in 2015		
Capital in excess of par value	504.9	1,151.8
Retained earnings	469.9	365.2
Treasury stock, at cost, 6,168,907 shares as of December 31, 2016 and 5,057,382		
shares as of December 31, 2015	(305.2	) (261.4
Accumulated other comprehensive (loss)	(403.8	) (487.4
Total shareholders' equity	266.4	768.8
Total liabilities and shareholders' equity	\$ 1,758.0	\$ 2,687.2

See accompanying notes to consolidated financial statements beginning on page 44.



## Armstrong World Industries, Inc., and Subsidiaries

## Consolidated Statements of Equity

(amounts in millions, except share data)

	Common Stock Shares	Common Stock Amount	Additional Paid-In Capital	Retained Earnings	Treasury Stock Shares	Treasury Stock Amount	Accumulated Other Comprehensive Income (Loss)	Total
December 31, 2013	54,406,927	\$ 0.6	\$ 1,098.4	\$ 207.2	5,057,382	\$(261.4)	\$ (371.6)	\$ 673.2
Stock issuance, net	719,226							
Share-based employee compensation			36.0					36.0
Net earnings				63.8				63.8
Other comprehensive loss							(123.9)	(123.9)
December 31, 2014	55,126,153	\$ 0.6	\$ 1,134.4	\$ 271.0	5,057,382	\$(261.4)	\$ (495.5)	\$ 649.1
Stock issuance, net	232,911							
Share-based employee compensation			17.4					17.4
Net earnings				94.2				94.2
Other comprehensive income							8.1	8.1
December 31, 2015	55,359,064	\$ 0.6	\$ 1,151.8	\$ 365.2	5,057,382	\$(261.4)	\$ (487.4)	\$ 768.8
Stock issuance, net	180,694							
Share-based employee compensation			9.2					9.2
Net earnings				104.7				104.7
Other comprehensive income							23.6	23.6
Separation of Armstrong Flooring, Inc.			(656.1)				60.0	(596.1)
Acquisition of treasury stock	(1,111,525)				1,111,525	(43.8)		(43.8)
December 31, 2016	54,428,233	\$ 0.6	\$ 504.9	\$ 469.9	6,168,907	\$(305.2)	\$ (403.8)	\$ 266.4

See accompanying notes to consolidated financial statements beginning on page 44.



## Armstrong World Industries, Inc., and Subsidiaries

## Consolidated Statements of Cash Flows

(amounts in millions)

	Years Ended December 31,		
	2016	2015	2014
Cash flows from operating activities:			
Net earnings	\$104.7	\$94.2	\$63.8
Adjustments to reconcile earnings to net cash provided by operating activities:			
Depreciation and amortization	89.2	118.3	129.4
Write off of debt financing costs	1.1	-	-
Gain (loss) on disposal of discontinued operations	(0.1 )	0.2	17.0
Impairment on assets of discontinued operations	-	-	11.9
Fixed and intangible asset impairments	-	-	15.8
Deferred income taxes	51.0	(48.5 )	41.5
Share-based compensation	12.4	13.4	12.7
Excess tax benefits from share-based awards	-	-	(8.4 )
Equity earnings from joint venture	(73.1 )	(66.1 )	(65.1 )
Separation costs	34.5	34.3	-
Loss on interest rate swap	10.7	-	-
U.S. pension expense	15.0	25.2	0.6
Non-cash foreign currency translation on intercompany loans	(3.6 )	19.8	37.2
Other, non-cash adjustments, net	(0.3 )	0.3	(0.5 )
Changes in operating assets and liabilities:			
Receivables	(23.9 )	2.7	(6.2 )
Inventories	(7.0 )	(15.7 )	(26.8 )
Other current assets	7.1	(7.3 )	(9.7 )
Other noncurrent assets	(9.9 )	7.9	(5.1 )
Accounts payable and accrued expenses	(82.1 )	15.0	(6.1 )
Income taxes payable	(49.3 )	33.6	24.2
Other long-term liabilities	(22.0 )	(22.2 )	(21.0 )
Other, net	(5.1 )	(1.4 )	3.6
Net cash provided by operating activities	49.3	203.7	208.8
Cash flows from investing activities:			
Purchases of property, plant and equipment	(104.2)	(170.7)	(222.9)
Return of investment from joint venture	86.9	64.2	67.9
Proceeds from (payment of) company-owned life insurance, net	-	2.2	(0.5 )
Proceeds from the sale of assets	0.1	2.8	7.9
Proceeds from settlement of note receivable	0.2	-	2.4
Net cash effect from deconsolidation of subsidiary	-	-	(4.1 )
Net cash (used for) investing activities	(17.0 )	(101.5)	(149.3)
Cash flows from financing activities:			
Proceeds from revolving credit facility and other short-term debt	90.0	-	122.8
Payments of revolving credit facility and other short-term debt	(90.0 )	-	(122.8)
Proceeds from long-term debt	363.5	-	-

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Payments of long-term debt	(434.1)	(39.5 )	(23.9 )
Financing costs	(8.1 )	-	-
Special dividends paid	-	(1.2 )	(1.3 )
Excess tax benefits from share-based compensation	-	-	8.4
Proceeds from exercised stock options	0.7	6.4	17.8
Cash transferred to Armstrong Flooring, Inc.	(9.1 )	-	-
Proceeds from company-owned life insurance loans, net	2.0	2.0	2.3
Payment for treasury stock acquired	(43.8 )	-	-
Net cash (used for) provided by financing activities	(128.9)	(32.3 )	3.3
Effect of exchange rate changes on cash and cash equivalents	(6.3 )	(10.4 )	(12.7 )
Net (decrease) increase in cash and cash equivalents	(102.9)	59.5	50.1
Cash and cash equivalents at beginning of year	244.8	185.3	135.2
Cash and cash equivalents at end of year	141.9	244.8	185.3
Cash and cash equivalents at end of year of discontinued operations	-	35.5	45.3
Cash and cash equivalents at end of year of continuing operations	\$141.9	\$209.3	\$140.0
Supplemental Cash Flow Disclosures:			
Interest paid	\$33.4	\$39.4	\$40.2
Income taxes paid, net	\$33.7	\$44.4	\$15.0
Amounts in accounts payable for capital expenditures	\$4.4	\$14.3	\$18.7

See accompanying notes to consolidated financial statements beginning on page 44.

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.

On April 1, 2016, we completed our previously announced separation of Armstrong Flooring, Inc. (“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. Subsequent to the separation and distribution, AWI and AFI operate as two independent, publicly-traded companies, with AFI owning and operating the Resilient Flooring and Wood Flooring segments and AWI continuing to own and operate the Building Products (Ceilings) segment. AFI’s historical financial results have been reflected in AWI’s Consolidated Financial Statements as a discontinued operation for all periods presented. Separation costs for 2016 and 2015 were \$34.5 million and \$34.3 million, respectively. Separation costs for all periods primarily related to outside professional services and employee compensation and retention and severance accruals which were recorded within the Unallocated Corporate segment in conjunction with this initiative. See Note 4 for additional information.

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 and schedule thereto have been recast to conform to the 2016 presentation.

**Revenue Recognition.** We recognize revenue from the sale of products when persuasive evidence of an arrangement exists, title and risk of loss transfers to the customers, prices are fixed and determinable, and it is reasonably assured the related accounts receivable is collectible. Our standard sales terms are Free On Board (“FOB”) shipping point. We have some sales terms that are FOB destination. Our products are sold with normal and customary return provisions. Sales discounts are deducted immediately from the sales invoice. Provisions, which are recorded as a reduction of revenue, are made for the estimated cost of rebates, promotional programs and warranties.

**Sales Incentives.** Sales incentives are reflected as a reduction of net sales.

**Shipping and Handling Costs.** Shipping and handling costs are reflected in cost of goods sold.

**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 16 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.

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.

Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

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 Americas segment, individually exceeded 10% of our revenues in 2016. Net sales in 2016 to these two customers totaled \$284.0 million. Net sales of \$131.7 million from one of these customers also exceeded 10% of our revenues in 2015. No one customer accounted for 10% or more of our total consolidated net sales in 2014. We monitor the creditworthiness of our customers and generally do not require collateral.

Receivables. We sell the vast majority of 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 current 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 or market. See Note 6 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 (10 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 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



Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

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.

**Intangible Assets.** Our definite-lived intangible assets are primarily customer relationships (amortized over 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. 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 intangibles are primarily trademarks and brand names, with Armstrong representing our primary trademark, which are integral to our corporate identity and expected to contribute indefinitely to our cash flows. Accordingly, they have been assigned an indefinite life. We perform annual impairment tests during the fourth quarter on these indefinite-lived intangibles. These assets undergo more frequent tests if an indication of possible impairment exists.

The principal assumption used in our impairment tests for definite-lived intangible assets is future operating profit adjusted for depreciation and amortization. The principal assumptions used in our impairment tests for indefinite-lived intangible assets include revenue growth rate, discount rate and royalty rate. Revenue growth rate and future operating profit assumptions are derived from those utilized in our operating plan and strategic planning processes. The discount rate assumption is calculated based upon an estimated weighted average cost of equity 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 asset to the overall profits of the reporting unit. Methodologies used for valuing our intangible assets did not change from prior periods.

See Note 10 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 account 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 income (loss) within shareholders' equity. Gains or losses on foreign currency transactions are recognized through the Consolidated Statement of Earnings and Comprehensive Income (Loss).

**Financial Instruments and Derivatives.** From time to time, we use derivatives and other financial instruments to offset the effect of currency, interest rate and commodity price variability. See Notes 17 and 18 to the Consolidated Financial Statements for further discussion.

**Share-based Employee Compensation.** We 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. See Note 21 to the Consolidated Financial Statements for additional information on share-based employee compensation.

**Subsequent Events.** We have evaluated subsequent events for potential recognition and disclosure through the date the consolidated financial statements included in the Annual Report on Form 10-K were issued.

Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

Recently Adopted Accounting Standards

In April 2015, the FASB issued ASU 2015-03, "Simplifying the Presentation of Debt Issuance Costs." This standards update amends existing guidance to require the presentation of debt issuance costs in the balance sheet as a deduction from the carrying amount of the related debt liability instead of a deferred charge. In August 2015, the FASB issued ASU 2015-15, "Presentation and Subsequent Measurement of Debt Issuance Costs Associated with Line-of-Credit Arrangements," which was issued to address the presentation and subsequent measurement of debt issuance costs related to line-of-credit arrangements. We adopted ASU 2015-03 and 2015-15 retrospectively, resulting in a \$9.5 million reduction to other non-current assets and a corresponding decrease to long-term debt as of December 31, 2016. As of December 31, 2015, our adoption of these ASC updates resulted in a \$4.7 million reduction to other non-current assets and a corresponding decrease to long-term debt. There was no impact on results of operations as a result of the adoption of this guidance.

In November 2015, the FASB issued ASU 2015-17, "Balance Sheet Classification of Deferred Taxes," which requires entities with a classified balance sheet to present all deferred tax assets and liabilities as non-current. This new guidance is effective for annual reporting periods beginning after December 15, 2016, but early adoption is permitted. Effective December 31, 2016, we elected to adopt this standard prospectively and as a result have classified all deferred tax assets and liabilities as non-current as of December 31, 2016. The adoption of this guidance had no impact on our results of operations or cash flows.

In November 2016, the FASB issued ASU 2016-18, "Restricted Cash," which amends ASC Topic 230: Statement of Cash Flows. This new guidance requires that the statement of cash flows explain the change in cash, cash equivalents and restricted cash. This new guidance must be adopted retrospectively and is effective for annual reporting periods beginning after December 15, 2017, but early adoption is permitted. Effective December 31, 2016, we elected to adopt this standard and as a result our 2016 Consolidated Statement of Cash Flows includes a \$4.0 million increase to cash and cash equivalents attributable to restricted cash. As of December 31, 2015 and 2014 we had no restricted cash.

Recently Issued Accounting Standards

In May 2014, the FASB issued ASU 2014-09, "Revenue from Contracts with Customers." The guidance requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to a customer. The ASU will replace most existing revenue recognition guidance in U.S. GAAP when it becomes effective. In August 2015, the FASB issued ASU 2015-14, "Revenue from Contracts with Customers: Deferral of the Effective Date," which defers the effective date for ASU 2014-09 by one year. In March 2016, the FASB issued ASU 2016-08, "Principal versus Agent Considerations (Reporting Gross versus Net)," which clarifies the implementation guidance in ASU 2014-09 relating to principle versus agent considerations. In April 2016, the FASB issued ASU 2016-10, "Identifying Performance Obligations and Licensing," which clarifies the implementation guidance in ASU 2014-09 relating to the identification of performance obligations in a contract, including how entities should account for shipping and handling services it provides after control of goods transfers to a customer. ASU 2016-10 also clarifies guidance on the timing and pattern of revenue recognition for intellectual property licenses. In May 2016, the FASB issued ASU 2016-12, "Narrow-Scope Improvements and Practical Expedients," which clarifies revenue recognition guidance related to the presentation of sales taxes, noncash consideration, and completed

contracts and contract modifications. In December 2016, the FASB issued ASU 2016-20, “Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers,” which clarifies the scope and application of the adoption of the new revenue recognition standard.

Collectively, the revenue recognition ASC updates are effective for annual reporting periods beginning after December 15, 2017, but early adoption is permitted. We intend to adopt these standards effective January 1, 2018 on a modified retrospective transition method and also intend on applying all practical expedients related to completed contracts upon adoption. We are still evaluating the impact the adoption of these ASC updates will have on our financial condition, results of operations and cash flows. Our final evaluation of the impact of adopting these ASC updates is expected to be completed during the third quarter of 2017.

In July 2015, the FASB issued ASU 2015-11, “Simplifying the Measurement of Inventory,” which requires inventory that is measured on a first-in, first-out or average cost basis to be measured at lower of cost and net realizable value, as opposed to the lower of cost or market. For inventory that is measured under the last-in, first-out (“LIFO”) basis or the retail recovery method, there is no change to current measurement requirements. This new guidance must be applied prospectively and is effective for annual reporting periods beginning after December 15, 2016, but early adoption is permitted. We do not believe the adoption of this standard will have a material impact on our financial condition, results of operations and cash flows.

Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

In January 2016, the FASB issued ASU 2016-01, "Recognition and Measurement of Financial Assets and Financial Liabilities," which addresses certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. Most notably, this new guidance requires equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income. This new guidance is effective for annual reporting periods beginning after December 15, 2017. Based on our preliminary evaluation, we do not believe the impact of adopting this standard will have a material impact on our financial condition, results of operations and cash flows.

In February 2016, the FASB issued 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 will require lessees to recognize a liability to make lease payments and a right-of-use asset representing its right to use the underlying asset for the lease term, with limited exceptions. The accounting applied by a lessor is largely unchanged from that applied under existing U.S. GAAP. This new guidance is effective for annual reporting periods beginning after December 15, 2018 and must be adopted under a modified retrospective basis. We are currently evaluating the impact the adoption of this standard would have on our financial condition, results of operations and cash flows.

In March 2016, the FASB issued ASU 2016-09, "Improvements to Employee Share-Based Payment Accounting," which amends ASC Topic 718: Compensation-Stock Compensation. This new guidance simplifies accounting for share-based payments, most notably by requiring all excess tax benefits and tax deficiencies to be recorded as income tax benefits or expense in the income statement and by allowing entities to recognize forfeitures of awards when they occur. This new guidance is effective for annual reporting periods beginning after December 15, 2016 and may be adopted prospectively or retroactively. We do not believe the adoption of this standard will have a material impact on our financial condition, results of operations and cash flows.

In August 2016, the FASB issued ASU 2016-15, "Classification of Certain Cash Receipts and Cash Payments," which amends the guidance in ASC Topic 230: Statement of Cash Flows. This guidance clarifies how entities should classify certain cash receipts and cash payments on the statement of cash flows. This new guidance is effective for annual periods beginning after December 15, 2017. We are currently evaluating the impact the adoption of this standard would have on our cash flows.

In January 2017, the FASB issued ASU 2017-01, "Clarifying the Definition of a Business," which amends the guidance in ASC Topic 805: Business Combinations. This guidance provides a new framework for determining whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. This new guidance is effective for annual periods beginning after December 15, 2017. We are currently evaluating the impact the adoption of this standard would have on our financial condition, results of operations and cash flows.

NOTE 3. NATURE OF OPERATIONS

Effective April 1, 2016 and in connection with our separation of AFI, our former Resilient Flooring and Wood Flooring segments have been excluded from our results of continuing operations. In addition, effective April 1, 2016, we disaggregated our former Building Products operating segment into the following three distinct geographical segments: Americas (including Canada); Europe, Middle East and Africa (including Russia) (“EMEA”); and Pacific Rim.

Each of our geographical segments produces suspended fiber and metal ceilings for use in commercial and institutional settings in addition to sourcing complementary ceiling products. Commercial ceiling materials and accessories are sold to resale distributors and to ceiling systems contractors. Residential ceiling products are sold in the Americas primarily to wholesalers and retailers (including large home centers). Each segment also includes the results of our Worthington Armstrong Venture (“WAVE”) joint venture with Worthington Industries, Inc., which manufactures suspension system (grid) products that are invoiced by both us and WAVE. Segment results relating to WAVE consist primarily of equity earnings and reflect our 50% equity interest in the joint venture. In each of our segments, WAVE primarily sells its suspension system products directly to customers, for which we provide sales and administrative support. To a lesser extent, however, in some markets, WAVE sells its suspension systems products to us for resale to customers. Our segment results reflect those sales transactions.

Effective April 1, 2016, we reclassified the majority of the assets and liabilities formally reported in our Unallocated Corporate segment to our Americas segment. The assets and liabilities reclassified to our Americas segment most notably included the Armstrong trade name intangible asset, property, plant and equipment comprised primarily of Corporate campus facilities, the cash surrender value of life insurance supporting deferred compensation liabilities, income tax assets and liabilities, and pension and postretirement assets and liabilities.

Armstrong World Industries, Inc., and Subsidiaries

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(dollar amounts in millions, except share data)

Balance sheet items classified as Unallocated Corporate for all periods presented primarily include cash and cash equivalents and outstanding borrowings under our senior credit facilities.

Segment results below have been restated for all periods presented as a result of the disaggregation of our former Building Products segment and the reclassification of Unallocated Corporate assets. These revisions did not impact any previously reported consolidated revenues, gross profit, results of continuing operations, or asset or liability balances.

	Americas	EMEA	Pacific Rim	Unallocated Corporate	Total
For the year ended 2016					
Net sales to external customers	\$ 837.3	\$ 263.1	\$ 134.1	\$ -	\$ 1,234.5
Equity (earnings) from joint venture	(70.2 )	(2.2 )	(0.7 )	-	(73.1 )
Segment operating income (loss)	232.1	(8.2 )	(0.5 )	(38.8 )	184.6
Segment assets	1,186.7	275.5	145.0	150.8	1,758.0
Depreciation and amortization <sup>(1)</sup>	52.9	16.7	8.1	0.1	77.8
Investment in joint venture	106.2	-	-	-	106.2
Purchases of property, plant and equipment <sup>(1)</sup>	66.4	19.1	6.6	-	92.1

	Americas	EMEA	Pacific Rim	Unallocated Corporate	Total
For the year ended 2015					
Net sales to external customers	\$ 805.1	\$ 289.9	\$ 136.3	\$ -	\$ 1,231.3
Equity (earnings) from joint venture	(63.5 )	(2.3 )	(0.3 )	-	(66.1 )
Segment operating income (loss)	283.5	(11.9 )	(6.8 )	(124.3 )	140.5
Segment assets	1,137.3	283.2	154.4	238.0	1,812.9
Depreciation and amortization <sup>(1)</sup>	43.2	15.6	8.8	11.6	79.2
Investment in joint venture	130.8	-	-	-	130.8
Purchases of property, plant and equipment <sup>(1)</sup>	52.2	30.5	4.0	22.4	109.1

	Americas	EMEA	Pacific Rim	Unallocated Corporate	Total
For the year ended 2014					
Net sales to external customers	\$ 798.3	\$ 353.4	\$ 142.6	\$ -	\$ 1,294.3
Equity (earnings) from joint venture	(61.6 )	(3.4 )	(0.1 )	-	(65.1 )
Segment operating income (loss)	272.1	(5.4 )	(2.0 )	(66.6 )	198.1

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Segment assets	1,127.4	296.6	166.3	165.1	1,755.4
Depreciation and amortization <sup>(1)</sup>	44.7	12.9	8.4	10.8	76.8
Asset impairment <sup>(1)</sup>	-	-	0.4	-	0.4
Investment in joint venture	129.0	-	-	-	129.0
Purchases of property, plant and equipment <sup>(1)</sup>	42.5	75.2	10.4	11.4	139.5

<sup>(1)</sup> – Totals for 2016, 2015 and 2014 will differ from the totals on our Consolidated Statement of Cash Flow by the amounts that have been classified as discontinued operations.

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 (Loss). 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:

	2016	2015	2014
Segment operating income	\$184.6	\$140.5	\$198.1
Interest expense	49.8	45.3	46.0
Other non-operating expense	0.1	20.1	5.9
Other non-operating income	(9.6 )	(5.0 )	(2.2 )
Earnings from continuing operations before income taxes	\$144.3	\$80.1	\$148.4



## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

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.

	2016	2015	2014
<b>Geographic Areas</b>			
Net trade sales			
<b>Americas:</b>			
United States	\$775.9	\$745.9	\$726.0
Canada	61.4	59.2	72.3
Total Americas	837.3	805.1	798.3
<b>EMEA:</b>			
United Kingdom	87.9	112.0	113.8
France	54.0	54.9	69.7
Netherlands	43.3	42.1	53.3
Russia	40.2	37.4	62.0
Other	37.7	43.5	54.6
Total EMEA	263.1	289.9	353.4
<b>Pacific Rim:</b>			
India	40.0	43.7	39.6
China	38.7	39.1	47.6
Australia	35.5	32.4	35.6
Other	19.9	21.1	19.8
Total Pacific Rim	134.1	136.3	142.6
Total net trade sales	\$1,234.5	\$1,231.3	\$1,294.3

	2016	2015
<b>Property, plant and equipment, net at December 31,</b>		
<b>Americas:</b>		
United States	\$426.7	\$403.8
Canada	34.8	28.9
Other	0.1	0.1
Total Americas	461.6	432.8
<b>EMEA:</b>		

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Russia	54.6	48.3
France	31.4	27.6
Germany	25.5	28.5
United Kingdom	18.0	21.8
Austria	17.4	17.6
Other	1.2	1.3
Total EMEA	148.1	145.1
Pacific Rim:		
China	58.5	69.1
Other	1.4	1.1
Total Pacific Rim	59.9	70.2
Total property, plant and equipment, net	\$669.6	\$648.1

Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

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

Effective January 1, 2016, in anticipation of the April 1, 2016 AFI separation, the majority of our historical corporate support functions, representing costs of approximately \$85 million for 2016 were incorporated into our Americas segment. As a result, Unallocated Corporate support expenses have decreased significantly during 2016 in comparison to 2015 and 2014.

For 2016, 2015 and 2014, Unallocated Corporate segment operating (loss) was comprised of the following:

	2016	2015	2014
Corporate expenses	\$(4.3 )	\$(90.0 )	\$(66.6)
Separation costs	(34.5)	(34.3 )	-
Total Unallocated Corporate segment operating (loss)	\$(38.8)	\$(124.3)	\$(66.6)

NOTE 4. DISCONTINUED OPERATIONS

Separation and Distribution of AFI

On April 1, 2016, 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 govern the relationship between AWI and AFI subsequent to the completion of the separation and distribution.

These agreements include a Transition Services Agreement, a Tax Matters Agreement, an Employee Matters Agreement, a Trademark License Agreement, a Transition Trademark License Agreement and a Campus Lease Agreement.

Under the Transition Services Agreement, AWI and AFI will provide various services to each other during a transition period expiring no later than December 31, 2017, including information technology, accounts payable, payroll, and other financial functions and administrative services. We do not anticipate the Transition Services Agreement will need to be extended beyond December 31, 2017.

The Tax Matters Agreement generally governs AWI's and AFI's respective rights, responsibilities and obligations after the separation and distribution with respect to tax liabilities and benefits, tax attributes, the preparation and filing of tax returns, the control of audits and other tax proceedings, and other matters regarding taxes for any tax period ending on or before the distribution date, as well as tax periods beginning after the distribution date. In addition, the Tax

Matters Agreement provides that AFI is liable for taxes incurred by AWI that may arise if AFI takes, or fails to take, certain actions that may result in the separation, the distribution or certain related transactions failing to qualify as tax-free for U.S. federal income tax purposes. Upon distribution, AWI received an opinion from its tax counsel that the separation and distribution qualified as a tax-free transaction for AWI and its shareholders.

The Employee Matters Agreement governs certain compensation and employee benefit obligations with respect to the current and former employees and non-employee directors of AWI and AFI. Pursuant to this agreement and in connection with the distribution, AWI transferred assets and liabilities from the AWI defined benefit pension and postretirement plans to AFI that relate to active AFI employees and certain former AFI employees to mirror plans established by AFI. Based on analyses provided by our actuaries, \$3.0 million and \$86.3 million of U.S. pension and U.S. postretirement benefit plan net liabilities under AWI's plans, respectively, were transferred to mirror plans established by AFI during 2016 as a result of the separation. The total net U.S. pension plan liability transferred to AFI of \$3.0 million consisted of a \$365.2 million projected benefit obligation, partially offset by the fair value of \$362.2 million of plan assets. See Note 16 for additional details.

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.

Under the Campus Lease Agreement, certain portions of the AWI headquarters are being leased to AFI to use as its corporate headquarters for an initial term of five years, subject to certain renewal rights.

Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

The following is a summary of the results of operations related to AFI, our former Resilient Flooring and Wood Flooring segments, which are presented as discontinued operations.

	2016	2015	2014
Net sales	\$284.4	\$1,188.7	\$1,221.0
Cost of goods sold	237.2	962.3	1,020.8
Gross profit	47.2	226.4	200.2
Selling, general and administrative expenses	50.5	179.5	148.4
Intangible asset impairments	-	-	10.8
Operating (loss) income	(3.3 )	46.9	41.0
Other non-operating expense, net	1.1	3.1	4.2
(Loss) earnings from discontinued operations before income tax	(4.4 )	43.8	36.8
Income tax expense	0.1	17.8	13.9
(Loss) earnings from discontinued operations	\$(4.5 )	\$26.0	\$22.9

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, 2015 related to AFI.

	December 31, 2015
Assets	
Current assets:	
Cash and cash equivalents	\$ 35.5
Accounts and notes receivable, net	70.0
Inventories, net	242.8
Deferred income taxes	5.7
Other current assets	27.2
Total current assets discontinued operations	381.2
Property, plant, and equipment, less accumulated depreciation and amortization	448.2
Intangible assets, net	42.5
Deferred income taxes	1.5
Other non-current assets	0.9
Total non-current assets of discontinued operations	493.1
Total assets of discontinued operations	\$ 874.3
Liabilities	
Current liabilities:	
Accounts payable and accrued expenses	\$ 149.3
Total current liabilities	149.3

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Long-term debt, less current installments	10.0
Postretirement benefit liabilities	85.2
Pension benefit liabilities	45.5
Other long-term liabilities	6.3
Deferred income taxes	7.3
Total non-current liabilities of discontinued operations	154.3
Total liabilities of discontinued operations	\$ 303.6

In connection with the separation and distribution of AFI, on April 1, 2016 we received a \$50.0 million dividend from AFI. In addition, \$60.0 million of accumulated other comprehensive losses, net of tax, were transferred to AFI, consisting of amounts related to transferred pension and postretirement liabilities, net derivatives assets and a cumulative translation adjustment. The impact of these items, in addition to the net effect of all assets and liabilities transferred to AFI upon separation resulted in a \$656.1 million reduction to additional paid-in capital as of December 31, 2016.

## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

The following is a summary of total depreciation and amortization, fixed and intangible asset impairments, and capital expenditures related to AFI which are presented as discontinued operations and included as components of operating and investing cash flows on our consolidated statements of cash flows:

	2016	2015	2014
Depreciation and amortization	\$11.4	\$39.1	\$46.6
Fixed and intangible asset impairments	-	-	15.4
Purchases of property, plant and equipment	(12.1)	(61.6)	(77.6)

## European Resilient Flooring

On December 4, 2014, our Board of Directors approved the cessation of funding to our former DLW subsidiary, which was our former European flooring business. As a result, DLW management filed for insolvency in Germany on December 11, 2014.

The following is a summary of the results related to the DLW business, which are included in discontinued operations. These results were previously presented as a part of the Resilient Flooring reporting segment.

	2014
(Loss) from discontinued operations before income tax	\$(23.7)
Income tax expense	-
(Loss) from discontinued operations	\$(23.7)

The DLW insolvency filing in December 2014 resulted in our disposal and presentation of DLW for all historical periods as a discontinued operation. However, the insolvency filing did not meet the U.S. tax criteria to be considered disposed of until the first quarter of 2015. In determining the U.S. tax impact of the disposition, the liabilities, including an unfunded pension liability of approximately \$115 million, were considered proceeds. However, pension deductions for tax purposes result only when the benefit payments are made. Accordingly, a deferred tax asset and non-cash income tax benefit of \$43.4 million were recorded in the first quarter of 2015 within discontinued operations for the tax benefit of the future pension deductions.

As of December 4, 2014, DLW had a net liability of \$12.9 million, representing assets of \$151.9 million and liabilities of \$164.8 million, which were removed from our balance sheet. This net liability was recognized as a contingent liability on our consolidated balance sheet pending the closure and results of the insolvency proceedings. Any shortfall will be recognized immediately when identified and any excess will be reflected when insolvency proceedings are finalized, all through discontinued operations. The amount of the net liability, included within Accounts payable and accrued expenses on our Consolidated Balance Sheets, was \$11.9 million and \$12.1 million as

of December 31, 2016 and 2015, respectively. DLW was previously shown within our Resilient Flooring reporting segment.

The following is a summary of the results related to the net gains and losses on disposal of our flooring businesses which are included in discontinued operations.

	2016	2015	2014
Gain (loss) on disposal of discontinued businesses before income tax	\$0.1	\$(0.8 )	\$(13.5)
Income tax (benefit)	(15.2)	(42.0)	(1.2 )
Net gain (loss) on disposal of discontinued businesses	\$15.3	\$41.2	\$(12.3)



## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

## Cabinets

In September 2012, we entered into a definitive agreement to sell our cabinets business to American Industrial Partners. The sale was completed in October 2012. The following is a summary of the results related to the cabinets business, which are included in discontinued operations.

	2015	2014
Gain (loss) on disposal of discontinued business before income tax	\$0.6	\$(3.5)
Income tax expense (benefit)	0.2	(1.3)
Net gain (loss) on disposal of discontinued business	\$0.4	\$(2.2)

## NOTE 5. ACCOUNTS AND NOTES RECEIVABLE

	December 31, 2016	December 31, 2015
Customer receivables	\$ 106.9	\$ 114.0
Customer notes	1.5	0.7
Miscellaneous receivables	6.0	6.4
Less allowance for warranties, discounts, and losses	(6.1 )	(6.8 )
Accounts and notes receivable, net	\$ 108.3	\$ 114.3

Generally, 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.

## NOTE 6. INVENTORIES

	December 31, 2016	December 31, 2015
Finished goods	\$ 80.5	\$ 72.0
Goods in process	3.3	4.2

Raw materials and supplies	32.4		32.0
Less LIFO and other reserves	(7.2	)	(6.8
Total inventories, net	\$ 109.0		\$ 101.4

Approximately 38% and 36% of our total inventory in 2016 and 2015, respectively, were valued on a LIFO (last-in, first-out) basis.

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

	December 31, 2016	December 31, 2015
International locations	\$ 63.8	\$ 59.0
U.S. sourced products	4.2	5.5
Total	\$ 68.0	\$ 64.5

Substantially all of our international locations use the 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.

The sourced products represent certain finished goods sourced from third party manufacturers, primarily from domestic suppliers.

## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

## NOTE 7. OTHER CURRENT ASSETS

	December 31, 2016	December 31, 2015
Prepaid expenses	\$ 15.0	\$ 20.4
Fair value of derivative assets	2.4	3.4
Certificates of deposit	0.4	7.6
Other	3.0	2.3
Total other current assets	\$ 20.8	\$ 33.7

## NOTE 8. PROPERTY, PLANT AND EQUIPMENT

	December 31, 2016	December 31, 2015
Land	\$ 38.0	\$ 38.3
Buildings	261.2	250.4
Machinery and equipment	706.4	669.7
Computer software	18.7	16.8
Construction in progress	90.8	76.7
Less accumulated depreciation and amortization	(445.5 )	(403.8 )
Net property, plant and equipment	\$ 669.6	\$ 648.1

See Note 2 to the Consolidated Financial Statements for discussion of policies related to property and depreciation and asset retirement obligations.

## NOTE 9. EQUITY INVESTMENTS

Investment in joint venture as of December 31, 2016 reflected the equity interest in our 50% investment in our WAVE joint venture. The WAVE joint venture is reflected in our consolidated financial statements using the equity method of accounting.

We use the equity in earnings method to determine the appropriate classification of distributions from WAVE within our cash flow statement. During 2016, 2015 and 2014, 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 2016, 2015 and 2014 were \$86.9 million, \$64.2 million, and \$67.9 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 \$98.1 million, \$97.4 million and \$109.4 million for the years ended 2016, 2015 and 2014, respectively.

Our recorded investment in WAVE was higher than our 50% share of the carrying values reported in WAVE's consolidated financial statements by \$166.6 million as of December 31, 2016 and \$172.1 million as of December 31, 2015. 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:

	December 31, 2016	December 31, 2015
Property, plant and equipment	\$ 0.4	\$ 0.4
Other intangibles	135.8	141.3
Goodwill	30.4	30.4
Total	\$ 166.6	\$ 172.1

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.

## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

See Exhibit 99.1 for WAVE's consolidated financial statements. Condensed financial data for WAVE is summarized below:

	December 31, 2016	December 31, 2015
Current assets	\$ 113.1	\$ 118.7
Noncurrent assets	50.3	52.1
Current liabilities	40.7	23.3
Other noncurrent liabilities	244.6	248.9

	2016	2015	2014
Net sales	\$393.7	\$374.4	\$392.5
Gross profit	208.7	187.4	185.1
Net earnings	158.9	144.4	142.2

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

## NOTE 10. INTANGIBLE ASSETS

We conduct our annual impairment testing of non-amortizing intangible assets during the fourth quarter. The 2016, 2015 and 2014 reviews concluded that no impairment charges were necessary. See Note 2 to the Consolidated Financial Statements for a discussion of our accounting policy for intangible assets.

The following table details amounts related to our intangible assets as of December 31, 2016 and 2015:

	Estimated Useful Life	December 31, 2016		December 31, 2015	
		Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Amortizing intangible assets					
Customer relationships	20 years	\$165.3	\$ 84.9	\$ 165.4	\$ 76.7
Developed technology	15 years	82.8	55.4	82.2	49.9
Other	Various	13.2	2.0	14.8	1.9
Total		\$261.3	\$ 142.3	\$ 262.4	\$ 128.5

Non-amortizing intangible assets			
Trademarks and brand names	Indefinite	314.4	313.3
Total intangible assets		\$575.7	\$ 575.7

	2016	2015	2014
Amortization expense	\$ 14.0	\$ 14.2	\$ 14.0

The expected annual amortization expense for the years 2017 through 2021 is approximately \$14 million.

NOTE 11. OTHER NON-CURRENT ASSETS

	December 31, 2016	December 31, 2015
Cash surrender value of company-owned life insurance policies	\$ 52.7	\$ 51.6
Fair value of derivative assets	7.6	-
Other	4.6	5.4
Total other non-current assets	\$ 64.9	\$ 57.0

## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

## NOTE 12. ACCOUNTS PAYABLE AND ACCRUED EXPENSES

	December 31, 2016	December 31, 2015
Payables, trade and other	\$ 108.6	\$ 127.5
Employment costs	33.7	44.7
Current portion of pension and postretirement benefit liabilities	12.7	14.3
Contingent liability related to discontinued operations	11.9	12.1
Other	30.2	32.5
Total accounts payable and accrued expenses	\$ 197.1	\$ 231.1

The decrease in accrued employment costs as of December 31, 2016 in comparison to December 31, 2015 was due to employee compensation and severance accruals recorded in 2015 in connection with our planned separation of the flooring business.

## NOTE 13. SEVERANCE AND RELATED COSTS

In 2016 and 2015, we recorded \$2.4 million and \$5.3 million, respectively, in Unallocated Corporate for severance and related costs to reflect approximately 30 position eliminations (including our former Chief Executive Officer) as a result of our initiative to separate our flooring business from our ceiling business. These costs are reflected within Separation costs on the Consolidated Statements of Earnings and Comprehensive Income (Loss).

In response to China market conditions, during the fourth quarter of 2015, we recorded \$2.0 million in cost of goods sold and \$0.9 million in SG&A expense for severance and related costs as a result of our decision to idle one of our plants in China effective during the fourth quarter of 2016. During 2016, we recorded an additional \$3.9 million in costs of goods sold and \$0.8 million in SG&A expense for severance and related costs as a result of the plant idling, which will result in approximately 190 position eliminations during the first quarter of 2017.

In 2015, we also recorded \$2.2 million in SG&A expense for severance and related costs to reflect approximately 30 position eliminations in Europe. The position eliminations were in response to poor construction market conditions in many parts of Europe.

## NOTE 14. INCOME TAXES

The tax effects of principal temporary differences between the carrying amounts of assets and liabilities and their tax bases are summarized in the following table. Management believes it is more likely than not that the results of future operations will generate sufficient taxable income in the appropriate jurisdiction and foreign source income to realize deferred tax assets, net of valuation allowances. In arriving at this conclusion, we considered the profit before tax generated for the years 2014 through 2016, as well as future reversals of existing taxable temporary differences and projections of future profit before tax and foreign source income.

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 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 not used as positive evidence related to the realization of the deferred tax assets in the assessment.

As of December 31, 2016 and 2015, we had \$760.6 million and \$863.1 million, respectively, of state net operating loss ("NOL") carryforwards expiring between 2017 and 2036. In addition, as of December 31, 2016 and 2015, we had \$149.0 million and \$202.9 million, respectively, of foreign NOL carryforwards. As of December 31, 2016, \$88.4 million of our foreign NOL carryforwards were available for carryforward indefinitely and \$60.6 million expire between 2017 and 2034. As of December 31, 2016, we also had U.S. foreign tax credit ("FTC") carryforwards of \$22.1 million on a gross basis, \$19.3 million when netted with unrecognized tax benefits that expire between 2017 and 2022. U.S. FTC carryforwards as of December 31, 2015 were \$27.1 million on a gross basis, \$12.3 million when netted with unrecognized tax benefits.



## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

As of December 31, 2016 and 2015, we had valuation allowances of \$60.5 million and \$69.1 million, respectively. As of December 31, 2016, our valuation allowance consisted of \$0.8 million for federal deferred tax assets related to FTC carryforwards, \$16.5 million for state deferred tax assets, primarily operating loss carryforwards, and \$43.2 million for foreign deferred tax assets, primarily foreign operating loss carryforwards. The valuation allowance for foreign deferred tax assets of \$43.2 million as of December 31, 2016 decreased \$12.1 million in comparison to December 31, 2015 primarily a result of additional foreign income in 2016. The valuation allowance for state deferred tax assets of \$16.5 million as of December 31, 2016 increased \$2.7 million in comparison to December 31, 2015 due to effects from the separation of AFI.

We estimate we will need to generate future federal taxable income of \$63.1 million, including foreign source income of \$52.9 million, to fully realize the FTCs before they expire in 2022. We estimate we will need to generate future taxable income of approximately \$772.7 million for state income tax purposes during the respective realization periods (ranging from 2017 to 2036) in order to fully realize the net deferred income tax assets discussed above.

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.

	December 31, 2016	December 31, 2015
Deferred income tax assets (liabilities)		
Net operating losses	\$ 71.9	\$ 83.7
Postretirement benefits	38.1	45.4
Pension benefit liabilities	45.2	74.0
Deferred compensation	17.8	24.2
Foreign exchange unrealized	1.3	18.8
Foreign tax credit carryforwards	19.3	12.3
State tax credit carryforwards	9.1	9.7
Other	16.9	30.4
Total deferred income tax assets	219.6	298.5
Valuation allowances	(60.5 )	(69.1 )
Net deferred income tax assets	159.1	229.4
Intangibles	(211.8 )	(214.3 )
Accumulated depreciation	(51.7 )	(52.5 )
Prepaid pension costs	(18.8 )	-
Inventories	(8.8 )	(7.5 )
Other	(9.1 )	(13.1 )
Total deferred income tax liabilities	(300.2 )	(287.4 )
Net deferred income tax liabilities	\$ (141.1 )	\$ (58.0 )

Deferred income taxes have been classified in the Consolidated Balance

Sheet as:

Deferred income tax assets - current	\$ -	\$ 29.8
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Deferred income tax assets - noncurrent	15.4	19.5
Deferred income tax liabilities - current	-	(0.6 )
Deferred income tax liabilities - noncurrent	(156.5 )	(106.7 )
Net deferred income tax liabilities	\$ (141.1 )	\$ (58.0 )

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Armstrong World Industries, Inc., and Subsidiaries

Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

	2016	2015	2014
Details of taxes			
Earnings (loss) from continuing operations before income taxes:			
Domestic	\$144.9	\$143.0	\$187.7
Foreign	(18.3 )	(38.2 )	(39.3 )
Elimination of dividends from foreign subsidiaries	17.7	(24.7 )	-
Total	\$144.3	\$80.1	\$148.4
Income tax expense (benefit):			
Current:			
Federal	\$2.5	\$25.1	\$26.6
Foreign	11.7	5.6	8.1
State	(0.5 )	0.2	1.4
Total current	13.7	30.9	36.1
Deferred:			
Federal	22.5	12.7	21.0
Foreign	(2.2 )	(0.5 )	0.1
State	16.4	10.4	12.1
Total deferred	36.7	22.6	33.2
Total income tax expense	\$50.4	\$53.5	\$69.3

We reviewed our position with regards to foreign unremitted earnings and determined that unremitted earnings would continue to be permanently reinvested. Accordingly we have not recorded U.S. income or foreign withholding taxes on approximately \$275.9 million of undistributed earnings of foreign subsidiaries that could be subject to taxation if remitted to the U.S. because we currently plan to keep these amounts permanently invested overseas. It is not practicable to calculate the residual income tax which would result if these basis differences reversed due to the complexities of the tax law and the hypothetical nature of the calculations.

	2016	2015	2014
Reconciliation to U.S. statutory tax rate			
Continuing operations tax at statutory rate	\$50.5	\$28.0	\$51.9
Increase in valuation allowances on deferred foreign			
income tax assets	16.2	19.3	18.7
State income tax expense, net of federal benefit	3.8	4.7	4.8
Separation costs	15.1	2.9	-

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Permanent book/tax differences	(2.6 )	3.0	(1.5 )
Increase in valuation allowances on deferred			
domestic income tax assets	0.8	4.1	3.0
Domestic production activities	(3.1 )	(5.1 )	(5.8 )
Tax on foreign and foreign-source income	(3.4 )	-	(0.7 )
Federal statute closure	(15.2)	-	-
Benefit from write-off of historical tax basis of foreign subsidiary	(13.7)	-	-
Other	2.0	(3.4)	(1.1 )
Tax expense at effective rate	\$50.4	\$53.5	\$69.3

As a result of the separation of AFI we incurred costs directly related to the separation transaction. Certain costs incurred to facilitate the transaction are not deductible for federal income tax purposes and result in a permanent difference.

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

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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.

We have \$86.9 million of Unrecognized Tax Benefits (“UTB”) as of December 31, 2016, \$63.1 million (\$61.6 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 \$0.1 million related to state statutes expiring and increase by \$3.7 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 reported \$4.0 million of interest and penalty exposure as noncurrent income tax payable in the Consolidated Balance Sheet as of December 31, 2016.

We had the following activity for UTB’s for the years ended December 31, 2016, 2015 and 2014:

	2016	2015	2014
Unrecognized tax benefits balance at January 1,	\$ 150.6	\$ 142.6	\$ 145.2
Gross change for current year positions	2.3	10.4	10.5
Increases for prior period positions	0.2	1.9	2.9
Decrease for prior period positions	(12.8 )	(4.1 )	(14.1 )
Decrease due to settlements and payments	-	-	(1.2 )
Decrease due to statute expirations	(53.4 )	(0.2 )	(0.7 )
Unrecognized tax benefits balance at December 31,	\$ 86.9	\$ 150.6	\$ 142.6

We conduct business globally, and as a result, 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 throughout the world in such major jurisdictions as Australia, Canada, Germany, India, the Netherlands, the United Kingdom and the United States. Generally, we have open tax years subject to tax audit on average of between three years and six years. The audit of our 2009 U.S. income tax return was finalized by the IRS in 2015. The statute of limitations is no longer open for U.S. federal returns before 2013. With few exceptions, the statute of limitations is no longer open for state or non-U.S. income tax examinations for the years before 2011. 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.

	2016	2015	2014
Other taxes			
Payroll taxes	\$26.5	\$27.4	\$30.6
Property, franchise and capital stock taxes	6.2	6.4	6.4

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## NOTE 15. DEBT

		Weighted		Weighted	
		Average		Average	
		Interest Rate		Interest Rate	
	December 31, 2016	for 2016	December 31, 2015	for 2015	
Term loan A due 2021	\$ 600.0	3.29	% \$ 496.0	3.24	%
Term loan B due 2023	248.1	4.58	% 461.9	3.50	%
Tax exempt bonds due 2041	35.0	0.45	% 35.1	0.87	%
Principal debt outstanding	883.1	3.54	% 993.0	3.28	%
Unamortized debt financing costs	(9.5 )		(4.7 )		
Long-term debt	873.6	3.54	% 988.3	3.28	%
Less current portion and short-term debt	25.0	3.42	% 52.1	3.26	%
Total long-term debt, less current portion	\$ 848.6	3.54	% \$ 936.2	3.28	%

The weighted average interest rates above are inclusive of our interest rate swaps. See Note 18 to the Consolidated Financial Statements for further information.

On April 1, 2016, we refinanced our \$1,275.0 million senior credit facility, utilizing a \$50.0 million cash dividend from AFI and cash on hand to pay down a portion of the debt outstanding. The \$1,050.0 million new credit facility is composed of a \$200.0 million revolving credit facility (with a \$150.0 million sublimit for letters of credit), a \$600.0 million Term Loan A and a \$250.0 million Term Loan B. The terms of the credit facility resulted in a lower interest rate spread for both the revolving credit facility and Term Loan A (2.00% vs. 2.50%) and a higher spread for Term Loan B (3.25% vs. 2.50%). In addition, we lowered the interest rate floor on the Term Loan B from 1.00% to 0.75%. We also extended the maturity of both the revolving credit facility and Term Loan A from March 2018 to April 2021 and of Term Loan B from November 2020 to April 2023. Finally, in April 2016, we established a \$25.0 million letter of credit facility with the Bank of Nova Scotia, also known as our bi-lateral facility.

In connection with the refinancing, we paid \$9.3 million of bank, legal and other fees, of which \$8.1 million were capitalized and recorded as a component of long-term debt and are being amortized into interest expense over the lives of the underlying loans. Additionally, we wrote off \$1.1 million of unamortized debt financing costs, included as a component of interest expense, in 2016 related to our previous credit facility. Finally, in connection with the refinancing, we executed new interest rate swaps. See Note 18 for additional details.

Under our refinanced senior credit facility we are subject to year-end leverage tests that may trigger mandatory prepayments. If our ratio of consolidated funded indebtedness, minus AWI and domestic subsidiary unrestricted cash and cash equivalents up to \$100.0 million, to consolidated earnings before interest, taxes, depreciation and

amortization (“EBITDA”) (“Consolidated Net Leverage Ratio”) is greater than 3.5 to 1.0, the prepayment amount would be 50% of fiscal year Consolidated Excess Cash Flow. These annual payments would be made in the first quarter of the following year. No payment will be required in 2017 under the senior credit facility.

As of December 31, 2016, we were in compliance with all covenants of the amended 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. Fully borrowing under our revolving credit facility would not violate these covenants.

As of December 31, 2016 our outstanding long-term debt included a \$35.0 million variable rate, tax-exempt industrial development bond that financed the construction of a plant in prior years. This bond has a scheduled final maturity of 2041 and is remarketed by an agent on a regular basis at a market-clearing interest rate. Any portion of the bond that is not successfully remarketed by the agent is required to be repurchased by AWI. This bond is backed by letters of credit which will be drawn if a portion of the bond is not successfully remarketed. We have not had to repurchase the bond.

Our foreign subsidiaries had available lines of credit totaling \$4.1 million as of December 31, 2016. These lines of credit are uncommitted, and poor operating results or credit concerns at the related foreign subsidiaries could result in the lines being withdrawn by the lenders. We have historically been able to maintain and, as needed, replace credit facilities to support our non-U.S. operations. As of December 31, 2016 there were no borrowings outstanding under these lines of credit.



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In March 2016, we amended and decreased our \$100.0 million Accounts Receivable Securitization Facility with the Bank of Nova Scotia (the “funding entity”) to \$40.0 million to reflect a lower anticipated receivables balance in connection with the separation of AFI, and we extended the maturity date from December 2017 to March 2019. Under our Accounts Receivable Securitization 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 LLC 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. As of December 31, 2016, there were no outstanding borrowings on the accounts receivable securitization facility. All new receivables under the program generated by the originators are continuously purchased by ARC with the proceeds from collections of receivables previously purchased. As of December 31, 2016 we had no borrowings under this facility.

None of our outstanding debt as of December 31, 2016 was secured with buildings and other assets. The credit lines under our revolving credit facility and at our foreign subsidiaries are subject to immaterial annual commitment fees.

## Scheduled payments of long-term debt:

2017	\$25.0
2018	32.5
2019	55.0
2020	62.5
2021	437.5
2022 and later	270.6

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. In addition, our foreign subsidiaries’ available lines of credit are available for letters of credit and guarantees. Letters of credit are 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.

In February 2017, we repriced the interest rate on our \$248.1 million Term Loan B borrowing, resulting in a lower LIBOR spread (2.75% vs. 3.25%). The maturity date remained unchanged along with all other terms and conditions. In connection with the repricing we paid \$0.6 million of bank, legal and other fees, the majority of which were capitalized.

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

Financing Arrangement	As of December 31, 2016		
	Limit	Used	Available
Revolving credit facility	\$150.0	\$-	\$ 150.0
Bi-lateral facility	25.0	19.2	5.8
Accounts receivable securitization facility	32.2	36.2	(4.0 )
Foreign lines of credit	0.2	0.1	0.1
Total	\$207.4	\$55.5	\$ 151.9

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, 2016, \$4.0 million of letters of credits issued under our accounts receivable securitization facility in excess of our maximum limit were classified as restricted cash and reported as a component of Cash and cash equivalents on our Consolidated Balance Sheets. This restriction will lapse upon replacement of collateral with accounts receivables and/or upon a change in the letter of credit limit as a result of higher securitized accounts receivable balances.

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## NOTE 16. 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 worldwide defined contribution benefit plans were \$10.2 million in 2016, \$9.2 million in 2015 and \$10.4 million in 2014.

## 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 Retirement Income Plan ("RIP") and the Retirement Benefit Equity Plan, 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 non-U.S. defined benefit pension plans cover employees in a number of foreign countries that utilize assumptions which are consistent with, but not identical to, those of the U.S. plans.

The following tables summarize the balance sheet impact of our 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.S. Pension Plans		Non-U.S. Pension Plans	
	2016	2015	2016	2015
Change in benefit obligation:				
Benefit obligation as of beginning of period	\$1,918.1	\$2,069.9	\$234.0	\$261.4
Service cost	10.1	16.3	2.2	2.4
Interest cost	69.8	80.9	6.9	8.3
Plan participants' contributions	-	-	0.1	0.1
Settlements and curtailments	-	-	0.2	-
Foreign currency translation adjustment	-	-	(35.6)	(16.5)
Actuarial loss (gain)	0.6	(130.5)	37.1	(6.7)
Benefits paid	(111.0)	(118.5)	(9.4)	(15.0)
Separation of AFI	(365.2)	-	(20.5)	-
Benefit obligation as of end of period	\$1,522.4	\$1,918.1	\$215.0	\$234.0

	U.S. Pension Plans		Non-U.S. Pension Plans	
	2016	2015	2016	2015
<b>Change in plan assets:</b>				
Fair value of plan assets as of beginning of period	\$1,837.2	\$1,986.3	\$210.9	\$232.4
Actual return on plan assets	144.7	(34.2 )	40.8	3.3
Employer contribution	4.2	3.6	2.9	3.4
Plan participants' contributions	-	-	0.1	0.1
Foreign currency translation adjustment	-	-	(35.3 )	(13.3 )
Benefits paid	(111.0 )	(118.5 )	(9.4 )	(15.0 )
Separation of AFI	(362.2 )	-	(19.6 )	-
Fair value of plan assets as of end of period	\$1,512.9	\$1,837.2	\$190.4	\$210.9
Funded status of the plans	\$(9.5 )	\$(80.9 )	\$(24.6 )	\$(23.1 )

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	U.S. Pension Plans		Non-U.S. Pension Plans	
	2016	2015	2016	2015
Weighted-average assumptions used to determine benefit obligations at end of period:				
Discount rate	4.12%	4.40%	2.40%	3.40%
Rate of compensation increase	3.10%	3.10%	3.10%	2.60%
Weighted-average assumptions used to determine net periodic benefit cost for the period:				
Discount rate	4.40%	4.05%	3.10%	3.40%
Expected return on plan assets	6.75%	7.00%	4.20%	4.50%
Rate of compensation increase	3.10%	3.10%	2.60%	2.60%

Effective December 31, 2016, we elected to measure the U.S. Pension Plans' benefit obligation by applying spot rates along the yield curve to the relevant projected cash flows, as we believe this provides a better measurement of these costs. This change in methodology requires management to utilize different discount rates to measure service cost and interest cost. We have accounted for this change in discount rate methodology as a change in accounting estimate and, accordingly have applied it on a prospective basis. This change did not affect the measurement of the total benefit obligation.

## Basis of Rate-of-Return Assumption

Long-term asset class return assumptions 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.

For the U.S. pension plan, these forecasted gross returns were reduced by estimated management fees and expenses, yielding a long-term return forecast of 6.75% and 7.00% for the years ended December 31, 2016 and 2015, respectively.

For the non-U.S. pension plan, these forecast asset class returns were weighted by the plans' target asset class weights, yielding a long-term return forecast of 4.20% and 4.50% for the years ended December 31, 2016 and 2015, respectively.

The accumulated benefit obligation for the U.S. defined benefit pension plans was \$1,518.0 million and \$1,896.8 million as of December 31, 2016 and 2015, respectively. The accumulated benefit obligation for the non-U.S. defined

benefit pension plans was \$211.7 million and \$226.1 million as of December 31, 2016 and 2015, respectively.

	U.S. Pension Plans		Non-U.S. Pension Plans	
	2016	2015	2016	2015
Pension plans with benefit obligations in excess of assets				
Projected benefit obligation, December 31	\$58.2	\$1,918.1	\$40.9	\$58.3
Accumulated benefit obligation, December 31	58.1	1,896.8	39.4	52.7
Fair value of plan assets, December 31	-	1,837.2	8.3	26.8

The components of the pension cost are as follows:

	U.S. Pension Plans			Non-U.S. Pension Plans		
	2016	2015	2014	2016	2015	2014
Service cost of benefits earned during the period	\$10.1	\$16.3	\$14.4	\$2.2	\$2.4	\$2.5
Interest cost on projected benefit obligation	69.8	80.9	85.7	6.9	8.3	10.5
Expected return on plan assets	(110.6)	(140.3)	(139.3)	(7.8)	(9.0)	(11.5)
Amortization of prior service cost	1.6	1.9	1.9	-	-	-
Recognized net actuarial loss	48.3	72.8	42.4	1.2	2.8	2.1
Net periodic pension cost	\$19.2	\$31.6	\$5.1	\$2.5	\$4.5	\$3.6
Less: Discontinued operations	2.2	11.0	1.2	-	(0.2)	(0.1)
Net periodic pension cost, continuing operations	\$17.0	\$20.6	\$3.9	\$2.5	\$4.7	\$3.7

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Excluded from non-U.S. net periodic pension costs in the preceding table were \$0.5 million of settlement charges recorded in 2015.

## 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.

## Non-U.S. Pension Plans

Each of the funded non-U.S. pension plans' primary investment objectives is to earn sufficient long-term returns on investments both to increase the ratio of the assets to liabilities in order for the plans to meet their benefits obligations and to minimize required contributions to the plans. This is expected to be achieved by (a) utilizing long duration bonds to limit the volatility of the plans' asset/liability ratios, (b) investing primarily in publicly-traded equities, and (c) limiting return volatility by diversifying investments among additional asset classes with differing expected rates of return and return correlations.

Each asset class utilized by the U.S. and non-U.S. defined benefit pension plans have defined asset allocation targets and allowable ranges. The table below shows the asset allocation targets and the December 31, 2016 and 2015 positions for each asset class:

Asset Class	U.S. Pension Plans			Non-U.S. Pension Plans				
	Target			Target				
	Weight			Weight				
	at			at				
	Position at							
	December 31, 2016	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	December 31, 2015	December 31, 2015	
Long duration bonds	59.0%	55.0%	59.0%	50.0%	49.0	%	46.0	%
Equities	30.0%	26.0%	26.0%	43.0%	38.0	%	42.0	%
High yield bonds and real assets	6.0 %	7.0 %	8.0 %	-	-		-	
Real estate and private equity	4.0 %	5.0 %	5.0 %	7.0 %	7.0	%	7.0	%
Other	1.0 %	7.0 %	2.0 %	-	6.0	%	5.0	%

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.

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.



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The following table sets forth by level within the fair value hierarchy a summary of the U.S. and non-U.S. defined benefit pension plan assets measured at fair value on a recurring basis:

Description	Value at December 31, 2016							
	U.S. Pension Plans				Non-U.S. Pension Plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Bonds	\$-	\$831.7	\$-	\$831.7	\$1.0	\$92.9	\$-	\$93.9
Equities	329.0	60.1	-	389.1	1.0	71.5	-	72.5
High yield bonds	-	67.6	-	67.6	-	-	-	-
Real assets	-	32.5	-	32.5	-	-	-	-
Real estate	-	-	-	-	0.1	0.7	-	0.8
Other investments	-	-	2.8	2.8	-	0.6	4.6	5.2
Cash and other short-term								
investments	34.2	78.2	-	112.4	5.9	-	-	5.9
Net assets measured at fair value	\$363.2	\$1,070.1	\$2.8	\$1,436.1	\$8.0	\$165.7	\$4.6	\$178.3
Investments measured at net asset value				76.8				12.1
Net assets				\$1,512.9				\$190.4

Description	Value at December 31, 2015							
	U.S. Pension Plans				Non-U.S. Pension Plans			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Bonds	\$-	\$1,069.9	\$-	\$1,069.9	\$1.1	\$95.9	\$-	\$97.0
Equities	443.0	64.0	-	507.0	1.1	88.0	-	89.1
High yield bonds	-	82.0	-	82.0	-	-	-	-
Real assets	-	32.1	-	32.1	-	-	-	-
Real estate	-	-	-	-	0.1	0.7	-	0.8
Other investments	-	-	2.9	2.9	-	0.9	4.9	5.8
Cash and other short-term								
investments	12.8	48.0	-	60.8	3.4	-	-	3.4
Net assets measured at fair value	\$455.8	\$1,296.0	\$2.9	\$1,754.7	\$5.7	\$185.5	\$4.9	\$196.1
Investments measured at net asset value				82.5				14.8
Net assets				\$1,837.2				\$210.9

U.S. pension plan Level 3 assets remained relatively unchanged from December 31, 2015 to December 31, 2016, with the change in Level 3 assets during 2016 due primarily to unrealized gains and losses. Non-U.S. pension plan Level 3

assets decreased from December 31, 2015 to December 31, 2016 due mainly to the change in currency conversion from the Euro to the U.S. dollar.

The U.S. and non-U.S. defined benefit pension plans have investments in alternative investment funds as of December 31, 2016 and December 31, 2015 which are reported at fair value. Certain 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. and non-U.S. defined benefit pension plan assets’ interest in the funds. Furthermore, changes to the liquidity provisions of the funds may significantly impact the fair value of the U.S. and non-U.S. defined benefit pension plan assets’ interest in the funds. As of December 31, 2016, there were no restrictions on redemption of these investments.

During 2016, management re-evaluated the classification of its U.S. and non-U.S. plan investments relative to the determination of whether certain plan investments have a readily determinable fair value. Based on that re-evaluation, certain plan investments as of December 31, 2015 previously disclosed using the NAV practical expedient and excluded from the fair value hierarchy have been

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corrected and included within the above tables as Level 2 investments. This change in disclosure is not considered to be material to the consolidated financial statements and is consistent with the presentation amounts as of December 31, 2016.

The following table sets forth a summary of the U.S. and non-U.S. defined benefit pension plan investments measured at NAV:

Description	Value at December 31, 2016						Redemption Notice Period
	U.S. Pension Plans			Non-U.S. Pension Plans			
	Fair Value	Unfunded Commitments		Fair Value	Unfunded Commitments	Redemption Frequency	
Real estate	\$73.3	\$ 2.2		\$12.1	\$ -	Monthly/Quarterly	2-90 Days
Other investments	3.5	0.9		-	-	None	None
Investments measured at net asset value	\$76.8	\$ 3.1		\$12.1	\$ -		

Description	Value at December 31, 2015						Redemption Notice Period
	U.S. Pension Plans			Non-U.S. Pension Plans			
	Fair Value	Unfunded Commitments		Fair Value	Unfunded Commitments	Redemption Frequency	
Real estate	\$79.7	\$ 2.3		\$14.8	\$ -	Monthly/Quarterly	2-90 Days
Other investments	2.8	1.5		-	-	None	None
Investments measured at net asset value	\$82.5	\$ 3.8		\$14.8	\$ -		

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. For the non-U.S. plans, this category also includes investments in

individual corporate and government bonds. 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.

Equities: Consists of domestic and international investments in common and preferred stocks as well as investments in registered investment funds investing in equities tailored to institutional investors. Individual common and preferred stocks are valued at the closing price reported on the active market on which the individual securities are traded and classified as Level 1 assets above. There are no readily available market quotations for registered investment company funds. The fair value, classified as Level 2 assets above, is 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.

High yield bonds: Consists of an investment in a registered investment fund investing in fixed income securities tailored to institutional investors. There are no readily available market quotations for registered investment company funds. The fair value is 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 assets: Consists of a fund that has underlying investments in commodity futures contracts, as well as cash and fixed income instruments used as collateral instruments against the commodity future contracts. The futures contracts are considered real assets as the underlying securities include natural resources such as oil or precious metals, livestock, or raw agricultural products. The fair value is 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: The U.S. pension plan's real estate investments are comprised 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.

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For the non-U.S. plans, real estate investments are comprised of individual and pooled real estate mutual funds. Certain real estate funds were measured at fair value and classified as Level 2 assets above as the funds were valued at the closing price reported on the active market on which the individual funds are traded. Certain real estate funds were measured at fair value using the NAV practical expedient as no readily available market quotations exist for these real estate funds.

Other investments: For the U.S. pension plan, 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.

For the non-U.S. pension plans, consists primarily of an investment in individual life insurance policies. These investments, classified as Level 3 assets above, were measured at fair value based on an actuarial reserve calculated using life tables and by discounting the related cash flows based on a fixed interest rate.

Cash and other short-term investments: Cash and short term investments 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 payable 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.

## 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.

	2016	2015
U.S. defined-benefit retiree health and life insurance plans		
Change in benefit obligation:		
Benefit obligation as of beginning of period	\$ 190.3	\$ 221.4
Service cost	0.4	0.9
Interest cost	4.7	8.1
Plan participants' contributions	3.2	4.6
Actuarial (gain)	(7.7 )	(22.7 )
Benefits paid	(11.5 )	(22.0 )
Separation of AFI	(86.3 )	-

Benefit obligation as of end of period \$93.1 \$190.3

	2016	2015
Change in plan assets:		
Fair value of plan assets as of beginning of period	\$-	\$-
Employer contribution	8.3	17.4
Plan participants' contributions	3.2	4.6
Benefits paid	(11.5)	(22.0)
Fair value of plan assets as of end of period	\$-	\$-
Funded status of the plans	\$(93.1)	\$(190.3)

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	2016	2015
U.S. defined-benefit retiree health and life insurance plans		
Weighted-average discount rate used to determine benefit obligations at end of period	4.10%	4.25%
Weighted-average discount rate used to determine net periodic benefit cost for the		
period	4.17%	3.90%

Effective December 31, 2016 and similar to the election we made for our U.S. pension plans, we elected to measure the U.S. postretirement benefit plan's benefit obligation by applying spot rates along the yield curve to the relevant projected cash flows, as we believe this provides a better measurement of these costs. We have accounted for this change in discount rate methodology as a change in accounting estimate and, accordingly have applied it on a prospective basis. This change did not affect the measurement of the total benefit obligation.

The components of postretirement benefits costs are as follows:

	2016	2015	2014
U.S. defined-benefit retiree health and life insurance plans			
Service cost of benefits earned during the period	\$0.4	\$0.9	\$0.9
Interest cost on accumulated postretirement benefit obligation	4.7	8.1	10.9
Amortization of prior service (credit)	(0.3)	(0.6)	(0.6)
Amortization of net actuarial gain	(6.1)	(7.8)	(4.2)
Net periodic postretirement benefit (credit) cost	\$(1.3)	\$0.6	\$7.0
Less: Discontinued operations	(0.2)	0.8	3.7
Net periodic postretirement benefit (credit) cost, continuing operations	\$(1.1)	\$(0.2)	\$3.3

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 8.5% to 9.3% for post-65 retirees (depending on plan type) was assumed for 2017, decreasing ratably to an ultimate rate of 4.5% in 2025. 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
U.S. defined benefit retiree health and life insurance benefits plans		
Effect on total service and interest cost components	\$(0.1)	\$ -
Effect on postretirement benefit obligation	(0.8)	0.5

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

	Retiree Health and Life					
	U.S. Pension Plans		Non-U.S. Pension Plans		Insurance Benefits	
	2016	2015	2016	2015	2016	2015
Prepaid pension costs	\$48.7	\$-	\$7.9	\$8.3	\$-	\$-
Accounts payable and accrued expenses	(3.9 )	(4.0 )	(0.5 )	(0.7 )	(8.3 )	(9.6 )
Postretirement benefit liabilities	-	-	-	-	(84.8)	(87.2)
Pension benefit liabilities	(54.3)	(31.4)	(32.0)	(30.7)	-	-
Net amount recognized	\$(9.5 )	\$(35.4)	\$(24.6)	\$(23.1)	\$(93.1)	\$(96.8)



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

	U.S. Pension Plans		Non-U.S. Pension Plans		Retiree Health and Life Insurance Benefits	
	2016	2015	2016	2015	2016	2015
	Net actuarial (loss) gain	\$ (553.5)	\$ (775.6)	\$ (22.4)	\$ (26.6)	\$ 51.7
Prior service (cost) credit	(1.5 )	(3.9 )	(0.6 )	(0.6 )	0.1	0.6
Accumulated other comprehensive (loss) income	\$ (555.0)	\$ (779.5)	\$ (23.0)	\$ (27.2)	\$ 51.8	\$ 92.1

For U.S. pension plans, we expect to amortize \$18.1 million of previously unrecognized prior service cost and net actuarial losses into pension cost in 2017 and expect contribute \$3.9 million in 2017.

For non-U.S. pension plans, we expect to amortize \$1.3 million of previously unrecognized net actuarial losses and unrecognized prior service cost into pension cost in 2017 and expect to contribute \$2.7 million in 2017.

For our U.S. postretirement benefit plans, we expect to amortize \$3.6 million of previously unrecognized net actuarial gains and prior service credits into postretirement benefit cost in 2017 and expect to contribute \$8.4 million in 2017.

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 (1)	Non-U.S. Pension Benefits	Retiree Health and Life Insurance
---------------------------	---------------------------	-----------------------------------

			Benefits, Net
2017	\$ 109.6	\$ 6.5	\$ 8.4
2018	108.7	6.7	8.2
2019	108.3	7.3	7.8
2020	106.8	7.7	7.4
2021	105.8	8.1	7.0
2022 - 2026	508.8	44.0	31.3

<sup>(1)</sup>We were not required and did not make contributions to the RIP during 2016 or 2015 as, based on guidelines established by the Pension Benefit Guaranty Corporation, the RIP had sufficient assets to fund its distribution obligations. Benefit payments to participants have been made directly from the RIP to participants from the assets of the plan.

#### NOTE 17. 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, 2016		December 31, 2015	
	Carrying amount	Estimated fair value	Carrying amount	Estimated fair value
Assets/(Liabilities), net:				
Total debt, including current portion	\$(873.6 )	\$( 873.7 )	\$(988.3 )	\$( 989.4 )
Foreign currency contracts	1.6	1.6	3.3	3.3
Natural gas contracts	1.0	1.0	(0.8 )	(0.8 )
Interest rate swap contracts	6.9	6.9	(10.6 )	(10.6 )

The carrying amounts of cash and cash equivalents, receivables, accounts payable, accrued expenses, and short-term debt approximate fair value because of the short-term maturity of these instruments. The fair value estimates of long-term debt were primarily based upon quotes from a major financial institution of recently observed trading levels of our Term Loan A and Term Loan B debt, respectively. The fair value estimates of foreign currency contracts are estimated from market quotes provided by a well-recognized national market data provider. The fair value estimates of natural gas contracts are estimated using internal valuation models with

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verification by obtaining quotes from major financial institutions. For natural gas swap transactions, fair value is calculated using NYMEX market quotes provided by a well-recognized national market data provider. For natural gas option based strategies, fair value is calculated using an industry standard Black-Scholes model with market based inputs, including but not limited to, underlying asset price, strike price, implied volatility, discounted risk free rate and time to expiration, provided by a well-recognized national market data provider. The fair value estimates for interest rate swap contracts are estimated by obtaining quotes from major financial institutions with verification by internal valuation models. Refer to Note 18 for a discussion of the fair value and the related inputs used to measure fair value.

The fair value measurement of assets and liabilities is summarized below:

	December 31, 2016		December 31, 2015	
	Fair value based on	Fair value based on	Fair value based on	Fair value based on
	Quoted,	Other	Quoted,	Other
	active	observable	active	observable
	markets	inputs	markets	inputs
	Level 1	Level 2	Level 1	Level 2
Assets/(Liabilities), net:				
Foreign currency contracts	\$ 1.6	\$ -	\$ 3.3	\$ -
Natural gas contracts	-	1.0	-	(0.8 )
Interest rate swap contracts	-	6.9	-	(10.6 )

We do not have any financial assets or liabilities that are valued using Level 3 (unobservable) inputs.

## NOTE 18. 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 forward swaps and option contracts to hedge these exposures. Exposure to individual counterparties is controlled and derivative financial instruments are entered into with a diversified group of major financial institutions. Forward swaps and option contracts are entered into for periods consistent with underlying exposure and do not constitute positions independent of those exposures. At inception, hedges that we designate as hedging instruments are formally documented as either (1) a hedge of a forecasted transaction or “cash flow” hedge, or (2) a hedge of the fair value of a recognized liability or asset or “fair value” 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 either the fair value or 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.

#### Counterparty Risk

We only enter into derivative transactions with established 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 thus we consider the risk of counterparty default to be negligible.

#### Commodity Price Risk

We purchase natural gas for use in the manufacturing process and to heat many of our facilities. As a result, we are exposed to fluctuations in the price of natural gas. We have a policy of reducing North American natural gas price volatility by purchasing natural gas forward contracts and swaps, purchased call options, and zero-cost collars up to 24 months forward. The contracts are based on forecasted usage of natural gas measured in mmBtu’s. There is a high correlation between the hedged item and the hedge instrument. The gains and losses on these instruments offset gains and losses on the transactions being hedged. These instruments are designated as cash flow hedges. As of December 31, 2016 and December 31, 2015, the notional amount of these hedges was \$7.4 million and \$9.2 million, respectively. The mark-to-market gain or loss on qualifying hedges is included in other comprehensive income to the extent effective, and reclassified into cost of goods sold in the period during which the underlying gas is consumed. The

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mark-to-market gains or losses on ineffective portions of hedges are recognized in cost of goods sold immediately. The earnings impact of the ineffective portion of these hedges was not material for the years ended December 31, 2016, 2015 and 2014.

Currency Rate Risk – Sales and Purchases

We manufacture and sell our products in a number of countries throughout the world and, as a result, we are exposed to movements in foreign currency exchange rates. To a large extent, our global manufacturing and sales provide a natural hedge of foreign currency exchange rate movement, as foreign currency expenses generally offset foreign currency revenues. We manage our cash flow exposures on a net basis and when possible, use derivatives to hedge our unmatched foreign currency cash inflows and outflows. Our major foreign currency exposures as of December 31, 2016, based on operating profits by currency, are to the Chinese renminbi, Russian ruble, Euro and Canadian dollar.

We use foreign currency forward exchange contracts to reduce our exposure to the risk that the eventual net cash inflows and outflows resulting from the sale of products to foreign customers and purchases from foreign suppliers will be adversely affected by changes in exchange rates. These derivative instruments are used for forecasted transactions and are classified as cash flow hedges. Cash flow hedges are executed quarterly, generally up to 15 months forward, and allow us to further reduce our overall exposure to exchange rate movements, since gains and losses on these contracts offset gains and losses on the transactions being hedged. The notional amount of these hedges was \$34.6 million and \$38.4 million at December 31, 2016 and December 31, 2015, respectively. Gains and losses on these instruments are recorded in other comprehensive income, to the extent effective, until the underlying transaction is recognized in earnings. The mark-to-market gains or losses on ineffective portions of hedges are recognized in SG&A expense. The earnings impact of the ineffective portion of these hedges was not material for the years ended December 31, 2016, 2015 and 2014.

Currency Rate Risk - Intercompany Loans and Dividends

Where efficient, reliable and liquid markets exist we may utilize foreign currency forward exchange contracts to hedge exposures created by cross-currency intercompany loans and dividends. The translation adjustments related to these loans and any offsetting gains or losses on the related derivative contracts are recorded in other non-operating income or expense. We did not have any open hedges related to intercompany loans and dividends as of December 31, 2016. The notional amount of these hedges was \$6.1 million as of December 31, 2015. Due to the significant decline in the value of the Russian Ruble, we received \$30.0 million in cash in 2014 as a result of settling Russian Ruble forward contracts utilized to hedge the currency impacts associated with intercompany loans to our Russian subsidiary. Our exposure to changes in the Ruble due to intercompany loans was unhedged at December 31, 2015. As of December 31, 2016 we had no outstanding intercompany loans to our Russian subsidiary.

Interest Rate Risk

We utilize interest rate swaps to minimize the fluctuations in earnings caused by interest rate volatility.

In connection with the refinancing of our credit facilities in April 2016, \$450.0 million of notional amount Term Loan B swaps with a trade date of March 27, 2012 were settled and \$10.7 million of losses recorded as a component of accumulated other comprehensive income were reclassified to interest expense in 2016.

As of December 31, 2015, we had a \$250.0 million notional Term A swap with a trade date of April 16, 2013 and a maturity date of March 2018, in which we received 3-month LIBOR and paid a fixed rate over the hedged period. On April 1, 2016, we entered into an additional \$200.0 million notional amount Term Loan A swap with a maturity date of March 2021, in which we also received 3-month LIBOR and paid a fixed rate over the hedged period, collectively resulting in \$450.0 million notional Term Loan A interest rate swaps (the "Term Loan A Swaps").

During the fourth quarter of 2016, we elected to change the floating rate basis for interest payments due under our Term Loan A credit facility from 3-month LIBOR to 1-month LIBOR. In connection with the change in our underlying interest payments, in November 2016 we entered into \$450.0 million forward-starting notional amount basis rate swaps to convert the floating rate risk under our Term Loan A Swaps from 3-month LIBOR to 1-month LIBOR and jointly designated the basis swaps with our Term Loan A Swaps in cash flow hedging relationships. As a result of this transaction, \$2.4 million of gains recorded as a component of accumulated other comprehensive income were reclassified as a reduction to interest expense during the fourth quarter of 2016. Since the basis rate swaps had a non-zero fair value upon designation as cash flow hedges, mark-to-market gains or losses on ineffective portions of these hedges will be recorded as a component of interest expense.

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Also on April 1, 2016, we entered into a \$100.0 million notional Term Loan B swap in which we receive the greater of 3-month LIBOR or a 0.75% LIBOR Floor and pay a fixed rate over the hedged period. These swaps were designated as cash flow hedges against changes in LIBOR for a portion of our variable rate debt.

The following table summarizes our interest rate swaps as of December 31, 2016:

	Notional			
Trade Date	Amount	Coverage Period		Risk Coverage
November 13, 2016	\$ 250.0	November 2016 to March 2018		Term Loan A
November 13, 2016	\$ 200.0	November 2016 to March 2021		Term Loan A
April 1, 2016	\$ 100.0	April 2016 to March 2023		Term Loan B

Gains and losses on these instruments are recorded in other comprehensive income, to the extent effective, until the underlying transaction is recognized in earnings. The mark-to-market gains or losses on the ineffective portion of hedges are recognized in interest expense. There was no earnings impact of the ineffective portion of these hedges for the years ended December 31, 2015 and 2014. The earnings impact of the ineffective portion of these hedges was not material for the years ended December 31, 2016.

## Financial Statement Impacts

The following tables detail amounts related to our derivatives as of December 31, 2016 and December 31, 2015. We did not have any derivative assets or liabilities not designated as hedging instruments for the years ended December 31, 2016 and 2015. 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	Fair Value	Balance Sheet	Fair Value	
	December 31,	December 31,	December 31,	December 31,	
Location	2016	2015	Location	2016	2015
Derivatives designated as hedging instruments					

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Natural gas	Other current			Accounts payable and		
commodity contracts	assets	\$ 1.0	\$ -	accrued expenses	\$ -	\$ 0.8
Foreign exchange	Other current			Accounts payable and		
contracts	assets	1.4	3.4	accrued expenses	-	0.1
Foreign exchange	Other non-current			Other long-term		
contracts	assets	0.2	-	liabilities	-	-
Interest rate swap	Other non-current			Other long-term		
contracts	assets	7.4	-	liabilities	0.5	10.6
Total derivatives designated as hedging instruments		\$ 10.0	\$ 3.4		\$ 0.5	\$ 11.5

Location of Gain

(Loss) Reclassified

	Amount of Gain (Loss) Recognized in			from AOCI into	Gain (Loss) Reclassified from		
	Accumulated Other Comprehensive			Income (Effective	AOCI into Income (Effective		
	Income ("AOCI") (Effective Portion)			Portion)	Portion)		
	2016	2015	2014		2016	2015	2014
<b>Derivatives in Cash Flow Hedging Relationships</b>							
Natural gas commodity				Cost of goods			
contracts	\$ 0.6	\$ (2.3 )	\$ (2.9 )	sold	\$ (1.2 )	\$ (4.4 )	\$ 0.7
Foreign exchange				Cost of goods			
contracts – purchases	-	1.2	1.1	sold	0.2	1.8	(0.2 )
Foreign exchange				Net			
contracts – sales	(2.9 )	4.7	4.6	sales	1.4	3.8	1.8
Interest rate swap				Interest			
contracts	6.8	(2.1 )	(9.3 )	expense	(8.3 )	(0.8 )	-
Total	\$ 4.5	\$ 1.5	\$ (6.5 )		\$ (7.9 )	\$ 0.4	\$ 2.3



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As of December 31, 2016, the amount of existing gains in AOCI expected to be recognized in earnings over the next twelve months is \$3.2 million.

The amount of pre-tax gains or losses recognized in income for derivative instruments not designated as hedging instruments were not material in 2016 and 2015. The amount of pre-tax gains or losses recognized in income for derivative instruments not designated as hedging instruments was \$29.6 million for 2014.

## NOTE 19. PRODUCT WARRANTIES

We provide limited warranties for defects in materials or factory workmanship, sagging and warping, and certain other manufacturing defects. 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 and 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 cost associated with warranty repairs are provided to our independent distributors through a credit against accounts receivable from the distributor to us.

The following table summarizes the activity for the accrual of product warranties for December 31, 2016 and 2015:

	2016	2015
Balance at beginning of period	\$0.4	\$0.2
Current year warranty accruals	8.6	2.0
Reductions for payments	(8.4)	(1.8)
Balance at end of period	\$0.6	\$0.4

## NOTE 20. OTHER LONG-TERM LIABILITIES

	December 31, 2016	December 31, 2015
Long-term deferred compensation arrangements	\$ 16.3	\$ 18.7
Long-term portion of derivative liabilities	0.5	10.6
Environmental liabilities	4.7	6.0
Other	7.6	8.0

Total other long-term liabilities	\$ 29.1	\$ 43.3
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## NOTE 21. SHARE-BASED COMPENSATION PLANS

The 2011 Long-Term Incentive Plan (“2011 LTIP”) authorized 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 was scheduled to terminate on June 24, 2021. On July 8, 2016 our shareholders approved an amendment and restatement of the 2011 LTIP, resulting in the 2016 Long-Term Incentive Plan (the “2016 LTIP”). The 2011 LTIP originally authorized up to 6,949,000 shares of common stock for issuance, and the amendment authorized an additional 2,000,000 shares of common stock for issuance, for a total of 8,949,000, which includes all shares that have been issued under the 2011 and 2016 LTIPs. The amendment also extended the expiration date of the 2016 LTIP to July 8, 2026, after which time no further awards may be made. As of December 31, 2016, 2,845,479 shares were available for future grants under the 2016 LTIP.

The 2008 Directors Stock Unit Plan (“2008 Director’s Plan”) authorized us to issue stock units to non-employee directors until October 2017. On July 8, 2016 our shareholders approved an amendment and restatement of the 2008 Director’s Plan, resulting in the 2016 Director’s Stock Unit Plan (the “2016 Director’s Plan”). The 2008 Plan originally authorized up to 300,000 shares of common stock for issuance, and the amendment authorized an additional 250,000 shares of common stock for issuance, for a total of 550,000, which includes all shares that have been issued under the 2008 and 2016 Director’s Plans. As of December 31, 2016, 258,793 shares were available for future grants under the 2016 Director’s Plan.

In connection with the separation of AFI and under the terms of our 2011 Plan and our 2008 Director’s Plan, all outstanding stock options, restricted stock units (“RSUs”) and performance-based restricted stock units (“PSUs”) were modified using a formula designed to preserve the intrinsic value of awards immediately before and after the separation. Outstanding awards to employees and

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non-employee directors at the time of separation were converted into awards of the holder's employer following separation. Modified outstanding awards will continue to vest over the original vesting periods.

Stock awards held upon separation were increased based on the ratio of AWI's New York Stock Exchange ("NYSE") volume weighted average closing stock price on April 1, 2016 (\$48.10) to the NYSE volume weighted average opening stock price on April 4, 2016 (\$42.11) as follows:

Stock options: The number of stock options outstanding were increased based on the ratio described above, with a corresponding decrease to the exercise price of outstanding awards in order to maintain the intrinsic value of outstanding stock options. The fair value of option grants was estimated immediately before and after the separation using the Black-Scholes option pricing model. The modification did not result in a change to the fair value of the awards, therefore, no incremental compensation expense was recorded upon modification.

RSUs (employee and director): The number of RSUs were increased based on the ratio described above to preserve the intrinsic value of awards immediately prior to the separation. Modification of these awards resulted in no incremental compensation expense.

PSUs: Upon separation, we had outstanding PSUs originally awarded in 2014 which had approximately one year remaining in their performance period. The amount of awards was fixed upon separation based on an assumed payout at target, with the final vesting year revised to a time-based vesting period. The number of PSUs were increased based on the ratio described above to preserve the intrinsic value of awards immediately prior to the separation. The probability of performance conditions being met was unchanged prior to and after modification, resulting in no incremental compensation expense.

The following table presents stock option activity for the year ended December 31, 2016:

	Number of shares (thousands)	Weighted-average exercise price	Weighted-average remaining contractual term (years)	Aggregate intrinsic value (millions)
Option shares outstanding, December 31, 2015	1,410.3	\$ 40.66		

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Option shares exercised	(25.6 )	(26.26 )		
Options forfeited	(23.5 )	(45.68 )		
Net impact as a result of AFI separation	(10.6 )	(44.21 )		
Option shares outstanding, December 31, 2016	1,350.6	\$ 34.66	4.5	\$ 11.6
Option shares exercisable, December 31, 2016	1,276.7	33.94	4.5	\$ 11.6
Option shares vested and expected to vest, December 31, 2016	1,350.3	34.66	4.5	\$ 11.6

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:

	2016	2015	2014
Total intrinsic value of stock options exercised	\$0.4	\$3.5	\$17.1
Cash proceeds received from stock options exercised	\$0.7	\$6.4	\$17.8
Tax (expense) deduction realized from stock options exercised	\$(0.1)	\$0.4	\$2.7

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The fair value of option grants was estimated on the date of grant using the Black-Scholes option pricing model. There were no option grants in 2016 or 2015. The weighted average historical pre-modification assumptions for 2014 is presented in the table below.

	2014
Weighted-average grant date fair value of options granted (dollars per option)	\$24.93
Assumptions	
Risk free rate of return	1.9 %
Expected volatility	46.5 %
Expected term (in years)	6.0
Expected dividend yield	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 option. The expected volatility was based on Armstrong's stock prices. The expected term represented the midpoint of the average vesting period and the contractual life of the grant was based on an allowable simplified method. The expected dividend yield was assumed to be zero because, at the time of each grant, we had no plans to declare a dividend.

We have also granted non-vested stock awards in the form of restricted stock, RSUs, performance restricted stock and PSUs. As of December 31, 2016 and 2015, we have no outstanding restricted stock or performance restricted stock. A summary of the 2016 activity related to these awards 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, 2015	413.3	\$ 54.66	216.9	\$ 52.84
Granted	114.3	41.53	254.4	39.23
Vested	(171.5)	(52.83)	(61.6)	(51.79)
Forfeited	(57.0)	(48.31)	(110.5)	(52.12)
Net impact as a result of AFI separation	(74.6)	(40.32)	(8.8)	(45.74)
December 31, 2016	224.5	\$ 44.94	290.4	\$ 40.29

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 Armstrong's common stock provided the defined financial targets are achieved at the end of the performance period. 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 9,581 and 17,545 RSUs as of December 31, 2016 and 2015, respectively, which are accounted for as liability awards as they are able to be settled in cash. The table above contains 720 and 6,537 PSUs as of December 31, 2016 and 2015, respectively, which are accounted for as liability awards as they are able to be settled in cash.

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 2016, we granted 158,790 PSUs 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 is presented in the table below.

	2016
Weighted-average grant date fair value of market based PSUs granted (dollars per award)	\$37.75
Assumptions	
Risk free rate of return	0.8 %
Expected volatility	28.0 %
Expected term (in years)	2.7
Expected dividend yield	0.0 %

## Armstrong World Industries, Inc., and Subsidiaries

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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. The expected life represented the performance period on the underlying award. The expected dividend yield was assumed to be zero because, at the time of each grant, we had no plans to declare a dividend.

In addition to the equity awards described above, as of December 31, 2016 we had 23,546 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, 2016 was \$1.8 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, 2016 and 2015, there were 189,237 and 197,475 RSUs, respectively, outstanding under the 2016 Directors Stock Unit Plan not reflected in the Non-Vested Stock Awards table above. In 2016 and 2015, we granted 25,714 and 22,997 restricted stock units, respectively, to non-employee directors. These awards generally have a vesting period of one year, and as of December 31, 2016 and 2015, 163,523 and 174,478 shares, respectively, were vested but not yet delivered. The awards are generally payable six months following the director's separation from service on the Board of Directors and 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 \$12.1 million (\$7.9 million net of tax benefit) in 2016; \$10.9 million (\$7.2 million net of tax benefit) in 2015, and \$10.3 million (\$6.9 million net of tax benefit) in 2014.

As of December 31, 2016, there was \$12.3 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 22. EMPLOYEE COSTS

	2016	2015	2014
Wages, salaries and incentive compensation	\$265.6	\$267.9	\$279.3
Payroll taxes	26.5	27.4	30.6
Defined contribution and defined benefit pension plan expense, net	29.7	34.5	18.0
Insurance and other benefit costs	24.9	20.6	21.9

Share-based compensation	12.1	10.9	10.3
Total	\$358.8	\$361.3	\$360.1

## NOTE 23. LEASES

We rent certain real estate and equipment. Several leases include options for renewal or purchase, and contain clauses for payment of real estate taxes and insurance. In most cases, management expects that in the normal course of business, leases will be renewed or replaced by other leases.

	2016	2015	2014
Rent expense	\$16.6	\$17.0	\$16.2
Sublease (income)	(0.3)	(0.4)	(0.4)
Net rent expense	\$16.3	\$16.6	\$15.8



## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

Future minimum payments at December 31, 2016 by year and in the aggregate, having non-cancelable lease terms in excess of one year are as follows:

	Total		Net
	Minimum		Minimum
	Lease	Sublease	Lease
	Payments	(Income)	Payments
Scheduled minimum lease payments			
2017	\$ 7.4	\$ (0.1 )	\$ 7.3
2018	6.0	(0.1 )	5.9
2019	4.6	(0.1 )	4.5
2020	3.2	(0.1 )	3.1
2021	2.4	-	2.4
Thereafter	2.4	-	2.4
Total	\$ 26.0	\$ (0.4 )	\$ 25.6

Assets under capital leases at December 31, 2016 and 2015 are not material.

## NOTE 24. SHAREHOLDERS' EQUITY

## Common Stock Repurchase Plan

On July 29, 2016, the Company announced that its Board of Directors had approved a share repurchase program pursuant to which the Company is authorized to repurchase up to \$150.0 million of its outstanding shares of common stock through July 31, 2018 (the "Program"). Repurchases under the Program may be made through open market, block and privately-negotiated transactions, including Rule 10b5-1 plans, at 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 the Company to repurchase any particular amount of common stock and may be suspended or discontinued at any time without notice. During 2016, 1.1 million shares were repurchased under the Program for a total cost of \$43.8 million, or an average price of \$39.45 per share.

## Accumulated Other Comprehensive (Loss)

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The balance of each component of accumulated other comprehensive (loss), net of tax as of December 31, 2016 and 2015 is presented in the table below.

	December 31, 2016	December 31, 2015
Foreign currency translation adjustments	\$ (71.6 )	\$ (33.8 )
Derivative gain (loss), net	3.8	(3.3 )
Pension and postretirement adjustments	(336.0 )	(450.3 )
Accumulated other comprehensive (loss)	\$ (403.8 )	\$ (487.4 )

The amounts and related tax effects allocated to each component of other comprehensive income (loss) for 2016, 2015, and 2014 are presented in the table below.

	Pre-tax Amount	Tax Benefit	After- tax Amount
2016			
Foreign currency translation adjustments	\$ (33.2 )	\$ -	\$ (33.2 )
Derivative gain, net	11.9	(4.4 )	7.5
Pension and postretirement adjustments	75.7	(26.4 )	49.3
Total other comprehensive income	\$ 54.4	\$ (30.8 )	\$ 23.6

## Armstrong World Industries, Inc., and Subsidiaries

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(dollar amounts in millions, except share data)

	Pre-tax Amount	Tax Expense	After-tax Amount
<b>2015</b>			
Foreign currency translation adjustments	\$ (25.5 )	\$ -	\$ (25.5 )
Derivative gain, net	1.1	(0.4 )	0.7
Pension and postretirement adjustments	50.7	(17.8 )	32.9
Total other comprehensive income	\$ 26.3	\$ (18.2 )	\$ 8.1

	Pre-tax Amount	Tax Benefit	After-tax Amount
<b>2014</b>			
Foreign currency translation adjustments	\$(29.6 )	\$ -	\$(29.6 )
Derivative (loss), net	(4.9 )	1.6	(3.3 )
Pension and postretirement adjustments	(153.6)	62.6	(91.0 )
Total other comprehensive (loss) income	\$(188.1)	\$ 64.2	\$(123.9 )

The following table summarizes the activity, by component, related to the change in AOCI for December 31, 2016 and 2015:

	Foreign Currency Translation Adjustments <sup>(1)</sup>	Derivative (Loss) Gain <sup>(1)</sup>	Pension and Postretirement Adjustments <sup>(1)</sup>	Total Accumulated Other Comprehensive (Loss) <sup>(1)</sup>
Balance, December 31, 2014	\$ (8.3 )	\$ (4.0 )	\$ (483.2 )	\$ (495.5 )
Other comprehensive (loss) income before reclassifications, net of				
tax expense (benefit) of \$ -, \$1.8, (\$6.4), and (\$4.6)	(25.5 )	3.5	(12.0 )	(34.0 )
Amounts reclassified from accumulated other				
comprehensive income	-	(2.8 )	44.9	42.1
Net current period other comprehensive (loss) income	(25.5 )	0.7	32.9	8.1

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Balance, December 31, 2015	\$ (33.8 )	\$ (3.3 )	\$ (450.3 )	\$ (487.4 )
Separation of AFI, net of tax (benefit) of \$-, \$-, (\$39.2), and (\$39.2)	(4.6 )	(0.4 )	65.0	60.0
Other comprehensive (loss) income before reclassifications, net of tax (benefit) of \$ -, (\$1.8), (\$10.9), and (\$12.8)	(33.2 )	3.0	20.2	(10.0 )
Amounts reclassified from accumulated other comprehensive income	-	4.5	29.1	33.6
Net current period other comprehensive (loss) income	(33.2 )	7.5	49.3	23.6
Balance, December 31, 2016	\$ (71.6 )	\$ 3.8	\$ (336.0 )	\$ (403.8 )

(1) Amounts are net of tax

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## Armstrong World Industries, Inc., and Subsidiaries

## Notes to Consolidated Financial Statements

(dollar amounts in millions, except share data)

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		Affected Line Item in the
	AOCI	2015	Consolidated Statement
	2016		of Earnings and
			Comprehensive Income
<b>Derivative Adjustments:</b>			
Natural gas commodity contracts	\$ 1.2	\$ 4.4	Cost of goods sold
Foreign exchange contracts - purchases	(0.2 )	(1.8 )	Cost of goods sold
Foreign exchange contracts - sales	(1.4 )	(3.8 )	Net sales
Interest rate swap contracts	8.3	0.8	Interest expense
Total income (loss) from continuing operations, before			
tax	7.9	(0.4 )	
Tax impact	(2.8 )	0.1	Income tax expense
Total income (loss) from continuing operations, net of			
tax	5.1	(0.3 )	
Total (loss) from discontinued operations, net of			
tax benefit of (\$0.3) and (\$1.3)	(0.6 )	(2.5 )	
Total income (loss), net of tax	4.5	(2.8 )	
<b>Pension and Postretirement Adjustments:</b>			
Prior service cost amortization	0.6	0.2	Cost of goods sold
Prior service cost amortization	0.6	0.4	SG&A expense
Amortization of net actuarial loss	20.7	22.1	Cost of goods sold
Amortization of net actuarial loss	18.4	21.3	SG&A expense
Total expense from continuing operations, before tax	40.3	44.0	
Tax impact	(14.1 )	(15.4 )	Income tax expense
Total expense from continuing operations, net of tax	26.2	28.6	
Total expense from discontinued operations net of			
tax expense of \$1.5 and \$8.8	2.9	16.3	
Total expense, net of tax	29.1	44.9	
Total reclassifications for the period	\$ 33.6	\$ 42.1	

## NOTE 25. SUPPLEMENTAL FINANCIAL INFORMATION

	2016	2015	2014
Selected operating expense			
Maintenance and repair costs	\$53.0	\$53.0	\$53.1
Research and development costs	18.8	19.7	19.8
Advertising costs	6.9	7.8	7.1
Other non-operating expense			
Foreign currency transaction loss, net of hedging activity	\$-	\$19.4	\$5.9
Other	0.1	0.7	-
Total	\$0.1	\$20.1	\$5.9
Other non-operating income			
Interest income	\$2.6	\$1.9	\$2.1
Foreign currency transaction gain, net of hedging activity	6.7	3.0	-
Other	0.3	0.1	0.1
Total	\$9.6	\$5.0	\$2.2

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NOTE 26. RELATED PARTIES

In some markets, 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 \$76.2 million in 2016, \$73.7 million in 2015 and \$85.4 million in 2014. 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 2016, \$15.2 million in 2015, and \$14.7 million in 2014. The net amount due to WAVE from us for all of our relationships was \$8.7 million as of December 31, 2016 and \$5.4 million as of December 31, 2015. See Note 9 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. These regulatory requirements continually change, therefore we cannot predict with certainty future expenditures associated with compliance with environmental requirements.

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 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 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 St. Helens, OR site, the

Macon, GA site and the Elizabeth City, NC site, each of which is summarized below. These efforts include 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. These proceedings are currently in early stages and 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.

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 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.

#### 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, OR facility, which was previously owned by Kaiser and then OC. The Consent Order requires that we and Kaiser complete a



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remedial investigation and feasibility study (“RI/FS”) on the portion of the site owned by us (“Owned Property”), which is comprised of Upland and Lowland areas. The Consent Order further requires us, Kaiser and OC to conduct an RI/FS in the In-Water area of the adjacent Scappoose Bay. Costs and responsibilities for investigation, including the current RI/FS, for the Owned Property have been shared with Kaiser pursuant to a cost sharing agreement with Kaiser. Costs and responsibilities for the investigation with respect to the in-water areas that we do not own have been shared with Kaiser and OC pursuant to a cost sharing agreement with Kaiser and OC.

On September 14, 2016, the parties submitted a Feasibility Study to the ODEQ proposing remedial action options for the Upland area. We have participated in the investigation phase for the Lowland area of the Owned Property and the Scappoose Bay and have been working with the ODEQ, Kaiser and OC to finalize the reports to move to the Feasibility Study phase. We have determined that it is probable that remedial action for certain portions of the Lowland area of the Owned Property will be required. The current estimate of our future liability at the site includes any remaining known investigation work required by the Consent Order and the current projected cost of remedial actions in the Upland area. At this time, we are unable to reasonably estimate any remediation costs that we may ultimately incur with respect to the Lowland portion of the Owned Property or the Scappoose Bay or whether the projected costs for the areas we have included in our current estimate will increase. Additional investigative or remedial action required by the ODEQ could result in additional costs greater than the amounts currently estimated. As discussed above, we are currently unable to predict the outcome or the timing of our insurance recovery proceedings. Accordingly, additional estimated costs for this matter may be incurred without regard for, and prior to, the resolution of our insurance recovery proceedings.

On September 30, 2016, Kaiser filed a voluntary petition for relief under Chapter 11 of the Bankruptcy Code in the U.S. Bankruptcy Court for the Western District of North Carolina (Case No. 16-31602). AWI, OC and the ODEQ have all been included on the master list of potential creditors filed with the Bankruptcy Court for notice purposes. By order dated October 14, 2016, the Bankruptcy Court formed a statutory committee of unsecured creditors, to which we were appointed to serve, along with OC and The Boeing Company. The Committee is charged with, among other things, maximizing recovery of all unsecured creditor claims, including claims of Kaiser and ODEQ. The Chapter 11 case may impact Kaiser’s ongoing participation in the RI/FS process, as well as the ODEQ consent order and cost sharing agreements. It may also delay implementation of remedial actions for the Upland area, as well as completion of the investigation phase for the Lowland area of the Owned Property and the Scappoose Bay. At this time, we are unable to predict whether and to what extent Kaiser intends to satisfy its environmental remediation obligations and liability to ODEQ. Specifically, we are unable to predict whether Kaiser intends to negotiate a settlement that would discharge its liability for the site, or whether it has sufficient insurance or other assets to cover its anticipated share of any site liability. Kaiser’s shares under cost sharing agreements were being funded by certain insurance policies, which comprised substantially all of Kaiser’s assets. If Kaiser, whether as a result of bankruptcy or otherwise, or OC are unwilling or unable to fulfill their obligations under the cost sharing agreements, or seek to contest or challenge the allocations, or if Kaiser’s insurance policies are unable to fund Kaiser’s share of environmental liability, it could result in additional cost to us greater than the amounts currently estimated and those costs may be material.

Macon, GA

The U.S. Environmental Protection Agency (“EPA”) has listed two landfills located on a portion of our Building Products 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 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”). We concluded the investigative phase of the Removal Action for the WWTP Landfill and submitted our final Engineering Evaluation/Cost Analysis (“EE/CA”) to the EPA in 2013. The EPA subsequently approved the EE/CA and issued an Action Memorandum in July 2013 selecting our recommended remedy for the Removal Action. In July 2014, we entered into an Administrative Order on Consent for Removal Action with the EPA for the WWTP Landfill. The EPA approved the Removal Action Work Plan on March 30, 2015 and the removal work commenced in the third quarter of 2015. 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 we are required to submit a Post-Removal Control Plan (the “Plan”) by March 28, 2017. We will implement the Plan once it is approved. That Plan will monitor the effectiveness of the WWTP Landfill response action 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 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 AWI’s property and Rocky Creek (the “Remaining Site,” also known as “Operable Unit 2”). On September 25, 2015, AWI and six other Potentially

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Responsible Parties (“PRPs”) received a Special Notice Letter from the EPA under CERCLA inviting AWI and the PRPs to enter into the negotiation of a Settlement Agreement (formerly known as an Administrative Order on Consent) to conduct an RI/FS of Operable Unit 2. We along with the PRPs submitted a good faith offer to the EPA in response to the Special Notice Letter to conduct RI/FS. We have not received a response to our good faith offer and have not yet entered into an Order with the EPA for Operable Unit 2. We have not yet commenced an investigation of this portion of the site. We anticipate that the EPA will require significant investigative work for Operable Unit 2 and that 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 AWI’s final share of the costs or the total costs associated with the investigation work or any resulting remediation therefrom, although such amounts may be material.

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”), 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. The EPA has requested a schedule for next steps (e.g. FS) working toward a Proposed Plan and Record Of Decision. If remediation is required the related costs may be material, although we expect these costs to be shared with CBS and the Navy.

Summary of Financial Position

Liabilities of \$4.7 million as of December 31, 2016 and \$6.0 million as of December 31, 2015 were recorded for potential environmental liabilities that we consider probable and for which a reasonable estimate of the probable liability could be made. During 2016, we recorded reserves for potential environmental liabilities of \$2.9 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 probable recoveries that are available through settlement as assets in the Consolidated Balance Sheets. No material amounts were recorded for probable recoveries as of December 31, 2016 or December 31, 2015.

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

We are involved in 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.

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## 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, 2016, 2015, and 2014:

	2016	2015	2014
Earnings from continuing operations	\$93.9	\$26.6	\$79.1
Earnings allocated to participating non-vested share awards	(0.3)	(0.1)	(0.4)
Earnings from continuing operations attributable to common shares	\$93.6	\$26.5	\$78.7

	2016	2015	2014
	(in millions)		
Basic shares outstanding	55.4	55.5	55.0
Dilutive effect of common stock equivalents	0.3	0.4	0.4
Diluted shares outstanding	55.7	55.9	55.4

Options to purchase 632,799, 203,527 and 142,038 shares of common stock were outstanding as of December 31, 2016, 2015, and 2014, respectively, but not included in the computation of diluted earnings per share, because the options were anti-dilutive.

## NOTE 29. SUBSEQUENT EVENT – ACQUISITION

On January 13, 2017 we completed our acquisition of the business and assets Tectum, Inc. (“Tectum”), headquartered in Newark, Ohio, for a total cash purchase of \$31.4 million. Tectum is a manufacturer of acoustical ceiling, wall and structural solutions for commercial building applications with two manufacturing facilities and 2016 revenues in excess of \$25 million.



ITEM CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND  
9. 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, 2016. 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, 2016 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.

ITEM 9B. OTHER INFORMATION

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Executive Officers of the Company (as of February 27, 2017):

Name	Age	Present Position and Business Experience During the Last Five Years*
Victor D. Grizzle	55	<p>Armstrong World Industries, Inc.</p> <p>President &amp; CEO, Director since April 2016</p> <p>Executive Vice President &amp; CEO, Armstrong Building Products (2011 to April 2016)</p>
Charles M. Chiappone	54	<p>Armstrong World Industries, Inc.</p> <p>Senior Vice President, Ceiling Solutions since April 2016</p> <p>Vice President of Global Marketing &amp; Commercial Excellence, Armstrong Building Products (January 2012 to April 2016)</p>
David S. Cookson	59	<p>Armstrong World Industries, Inc.</p> <p>Senior Vice President, Americas since 2008</p>
Mark A. Hershey	47	<p>Armstrong World Industries, Inc.</p> <p>Senior Vice President, General Counsel since July 2011</p> <p>Chief Compliance Officer since February 2012</p> <p>Secretary (July 2011 to June 2014 and since April 2016)</p>
Brian L. MacNeal	50	<p>Armstrong World Industries, Inc.</p> <p>Senior Vice President, Chief Financial Officer since April 2016</p> <p>Vice President, Global Finance and CFO, Armstrong Building Products (2014 to April 2016)</p> <p>Heartland Energy Solutions</p> <p>Interim Chief Financial Officer (2013 to 2014)</p>



Campbell Soup Company

Vice President of Finance (2011 to 2013)

Stephen F. McNamara 50 Armstrong World Industries, Inc.  
Vice President, Controller since July 2008

Ellen R. Romano 55 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 2015 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 2017 annual meeting of shareholders to be filed no later than April 28, 2017.

#### 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 2017 annual meeting of shareholders to be filed no later than April 28, 2017.

#### 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 2017 annual meeting of shareholders to be filed no later than April 28, 2017.

#### 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 2017 annual meeting of shareholders to be filed no later than April 28, 2017.

#### 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 2017 annual meeting of shareholders to be filed no later than April 28, 2017.

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 2016 Annual Report on Form 10-K is listed in the “Index to Financial Statements and Schedules” on Page 34.

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, 2016, 2015, and 2014 (filed herewith as Exhibit 99.1).

3. The following exhibits are filed as part of this 2016 Annual Report on Form 10-K:

Exhibit No. Description

- |      |   |
|------|---|
| 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 in 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 8-K filed on October 2, 2006, 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 July 28, 2014, wherein it appeared as Exhibit 3.1.  |
| 10.1 | Amended and Restated Credit Agreement, dated as of 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 March 15, 2013, by and among Armstrong World Industries, Inc., the grantors named therein and Bank of America, N.A., as collateral agent, is incorporated by reference from the Current Report on Form 8-K filed on March 18, 2013, wherein it appeared as Exhibit 10.2.   |
| 10.3 | Amended and Restated Pledge Agreement dated, March 15, 2013, by and among Armstrong World Industries, Inc., the pledgors named therein and Bank of America, N.A., as collateral agent, is incorporated by reference from the Current Report on Form 8-K filed on March 18, 2013, wherein it appeared as Exhibit 10.3.   |
| 10.4 | Amended and Restated Canadian Pledge Agreement dated, March 15, 2013, by and among Armstrong World Industries, Inc. and Bank of America, N.A., as collateral agent, is incorporated by reference from   |

- the Current Report on Form 8-K filed on March 18, 2013, wherein it appeared as Exhibit 10.4.
- 10.5 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.
- 10.6 Purchase and Sale Agreement dated as of December 10, 2010, by and among Armstrong World Industries, Inc., as originator and as initial servicer, Armstrong Hardwood Flooring Company, as originator, and Armstrong Receivables Company LLC, is incorporated by reference from the Current Report on Form 8-K filed on December 14, 2010, wherein it appeared as Exhibit 10.2.

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Exhibit No.	Description
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 Agreement, dated as of December 18, 2014, 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 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. †
10.12	Sixth Amendment 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. †
10.13	Stipulation and Agreement with Respect to Claims of Armstrong Holdings, Inc. and Armstrong Worldwide, Inc.; and Motion for Order Approving Stipulation and Agreement are incorporated by reference from the Current Report on Form 8-K filed on February 27, 2007, wherein they appeared as Exhibits 99.2 and 99.3, respectively.
10.14	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.
10.15	Transition Services 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 10.1.
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.

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Exhibit No.	Description
10.17	Employee 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 10.3.
10.18	Trademark License 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 10.4.
10.19	Transition Trademark License 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 10.5.
10.20	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.
10.21	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.*
10.22	Form of Stock Option Agreement under 2006 Long-Term Incentive Plan is incorporated by reference from the Current Report on Form 8-K filed on October 2, 2006, wherein it appeared as Exhibit 10.5.*
10.23	Form of Stock Option Award under the 2006 Long-Term Incentive Plan is incorporated by reference from the Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, filed on May 1, 2008, wherein it appeared as Exhibit 10.37.*
10.24	Stock Option Award under the 2006 Long-Term Incentive Plan to Thomas B. Mangas is incorporated by reference from the Current Report on Form 8-K filed on April 6, 2010, wherein it appeared as Exhibit 10.1.*
10.25	Form of Stock Option Award under the 2006 Long-Term Incentive Plan used in connection with award to Stephen F. McNamara is incorporated by reference from the Current Report on Form 8-K filed on April 6, 2010, wherein it appeared as Exhibit 10.2.*
10.26	Stock Option and Performance Restricted Stock Unit Awards under the 2006 Long-Term Incentive Plan to Donald R. Maier dated September 7, 2010, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.25.*
10.27	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.*
10.28	Forms of Stock Option and Performance Restricted Stock Unit Award under the 2006 Long-Term Incentive Plan used in connection with March 2011 grants to officers (except Donald R. Maier) and new hire grant for Mark A. Hershey, is incorporated by reference from the Annual Report on Form 10-K filed on February 27, 2012, wherein it appeared as Exhibit 10.27.*
10.29	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.*
10.30	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.*
10.31	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.*
10.32	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Nonqualified Stock Options — Non-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 10.3.\*

10.33

Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.4.\*

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Exhibit No.	Description
10.34	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – Payable in Cash – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.5.*
10.35	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – Payable in Shares – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.6.*
10.36	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Performance-Based Restricted Stock Units – Payable in Shares – 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 10.7.*
10.37	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Performance-Based Restricted Stock Units – Payable in Shares – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.8.*
10.38	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Performance-Based Restricted Stock Units – Payable in Cash – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2012, wherein it appeared as Exhibit 10.9.*
10.39	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Performance-Based Restricted Stock Units – Payable in Shares – Non-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 10.10.*
10.40	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.*
10.41	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.*
10.42	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.*
10.43	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.*
10.44	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.*
10.45	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Time-Based Restricted Stock Units – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 28, 2014, wherein it appeared as Exhibit 10.3.*
10.46	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Time-Based Restricted Stock Units – Payable in Cash – 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 10.4.*
10.47	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Time-Based Restricted Stock Units – Payable in Shares – 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 10.5.*
10.48	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Performance Restricted Stock Units – Payable in Shares – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 28, 2014, wherein it appeared as Exhibit 10.6.*
10.49	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Performance Restricted Stock Units – Payable in Cash – 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 10.7.*





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Exhibit No.	Description
10.50	Form of 2011 Long-Term Incentive Plan Terms and Conditions, as amended for 2014 (Grant of Performance Restricted Stock Units – Payable in Shares – 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 10.8.*
10.51	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2015, wherein it appeared as Exhibit 10.1.*
10.52	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – Payable in Cash – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2015, wherein it appeared as Exhibit 10.2.*
10.53	Form of 2011 Long-Term Incentive Plan Terms and Conditions (Grant of Time-Based Restricted Stock Units – Payable in Shares – Non-U.S.), is incorporated by reference from the Quarterly Report on Form 10-Q filed on April 30, 2015, wherein it appeared as Exhibit 10.3.*
10.54	Form of 2016 Award Agreement for Performance-Based RSU Grants under the 2011 Long-Term incentive Plan is incorporated by reference from the Current Report on Form 8-K filed on April 14, 2016, wherein it appeared as Exhibit 10.1. *
10.55	Form of Long-Term Time-Based Restricted Stock Unit Grant under the 2011 Long-Term Incentive Plan (previously filed as Exhibit 10.4 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.56	Form of Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Absolute TSR) for Senior Executives under the 2011 Long-Term Incentive Plan (previously filed as Exhibit 10.5 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.57	Form of Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Absolute TSR) under the 2011 Long-Term Incentive Plan (previously filed as Exhibit 10.6 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.58	Form of Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Cumulative Free Cash Flow) under the 2011 Long-Term Incentive Plan (previously filed as Exhibit 10.7 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.59	Form of Long-Term Performance-Based Restricted Stock Unit Grant (Performance Goals Based on Cumulative Free Cash Flow) for Senior Executives under the 2011 Long-Term Incentive Plan (previously filed as Exhibit 10.8 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.60	Armstrong World Industries, Inc. 2016 Long-Term Incentive Plan (previously filed as Exhibit 10.2 to the Company’s Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).*
10.61	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.*
10.62	Bonus Replacement Retirement Plan, effective as of January 1, 1998, as amended January 1, 2007, is incorporated by reference from the Annual Report on Form 10-K, filed on February 28, 2011, wherein it appeared as Exhibit 10.9*
10.63	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.*
10.64	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.*
10.65	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.\*

10.66 2007 Award under the 2006 Phantom Stock Unit Agreement and the Schedule of Participating Directors are incorporated by reference from the Current Report on Form 8-K filed on October 23, 2007, wherein they appeared as Exhibits 10.1 and 10.2, respectively.\*

10.67 Schedule of Armstrong World Industries, Inc. Nonemployee Directors Compensation Summary is incorporated by reference from the Quarterly Report on Form 10-Q, filed on July 29, 2013, wherein it appeared as Exhibit 10.3.\*

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Exhibit No.	Description
10.71	The 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.*
10.72	Form of 2009 Award under the 2008 Director 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.*
10.73	Form of 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.*
10.74	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.*
10.75	Armstrong World Industries, Inc. 2016 Directors Stock Unit Plan (previously filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).
10.76	Form of Stock Unit Grant Agreement under the Armstrong World Industries, Inc. 2016 Directors Stock Unit Plan (previously filed as Exhibit 10.3 to the Company's Current Report on Form 8-K filed on July 11, 2016 and incorporated herein by reference).
10.77	Employment Agreement with Matthew J. Espe dated June 24, 2010, is incorporated by reference from the Current Report filed on Form 8-K filed on June 25, 2010, wherein it appeared as Exhibit 10.1.*
10.78	Amendment to Employment Agreement with Matthew J. Espe dated March 9, 2015, is incorporated by reference from the Current Report filed on Form 8-K filed on March 10, 2015, wherein it appeared as Exhibit 10.1.*
10.79	Amendment to Employment Agreement with Matthew J. Espe dated December 31, 2012, is incorporated by reference from the Current Report filed on Form 8-K filed on January 4, 2013, wherein it appeared as Exhibit 10.4.*
10.80	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.*
10.81	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.*
10.82	Form of Change in Control Severance Agreement with Matthew Espe dated August 1, 2015, is incorporated by reference from the Quarterly Report on Form 10-Q filed on October 29, 2015, wherein it appeared as Exhibit 10.1.*
10.83	Form of Retention Agreement with Matthew J. Espe, David S. Schulz and Mark A. Hershey is incorporated by reference from the Report on Form 8-K filed on March 10, 2015, wherein it appeared as Exhibit 10.2.*
10.84	Severance Agreement and Release, dated as of March 30, 2016, by and between Armstrong World Industries, Inc. and Matthew Espe is incorporated by reference from the Current Report on Form 8-K filed on April 4, 2016, wherein it appeared as Exhibit 10.7.*
10.85	Form of Severance Agreement with David S. Schulz and Mark A. Hershey and Victor D. Grizzle is incorporated by reference from the Report on Form 8-K filed on March 10, 2015, wherein it appeared as Exhibit 10.3.*
10.86	Form of Change in Control Severance Agreement with Ms. Ellen R. Romano and Messrs. David S. Schulz, Victor D. Grizzle, Mark A. Hershey, Stephen H. Poole, and Stephen F. McNamara is incorporated by reference from the Quarterly Report on Form 10-Q filed on October 29, 2015, wherein it appeared as Exhibit 10.2.*
10.87	Change in Control Severance Agreement with Donald R. Maier, dated as of November 17, 2014, is incorporated by reference from the Report on Form 8-K filed on November 18, 2014, wherein it appeared as Exhibit 10.1.*

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- 10.88 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.\*
- 10.89 Transition Agreement with Donald R. Maier, dated as of March 31, 2014, is incorporated by reference from the Report on Form 8-K filed on April 4, 2014, wherein it appeared as Exhibit 10.1.\*
- 10.90 Form of 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.
- 11 Computation of Earnings Per Share.†

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Exhibit No.	Description
12	Computation of Ratio of Earnings to Fixed Charges.†
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, 2016 and 2015 and for the years ended December 31, 2016, 2015 and 2014.†
99.2	Armstrong World Industries, Inc. Asbestos Personal Injury Settlement Trust Agreement dated as of October 2, 2006, by and among Armstrong World Industries, Inc. and trustees, is incorporated by reference from the Current Report on Form 8-K filed on October 2, 2006, wherein it appeared as Exhibit 10.2.
99.3	Stockholder and Registration Rights Agreement, dated as of October 2, 2006, by and between Armstrong World Industries, Inc. and the Armstrong World Industries, Inc. Asbestos Personal Injury Settlement Trust is incorporated by reference from the Current Report on Form 8-K filed on October 2, 2006, wherein it appeared as Exhibit 10.3.
99.4	Nomination and Shareholder Agreement with the persons or entities identified on Schedule I attached thereto (collectively the “ValueAct Group” and each individually, a “member” of the ValueAct Group), and Gregory P. Spivy in his individual capacity and as a member of the ValueAct Group (the “ValueAct Designee”), is incorporated by reference from the Report on Form 8-K filed on December 15, 2014, wherein it appeared as Exhibit 99.1.
101	Interactive Data Files**

\* 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.

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 27, 2017

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 Armstrong and in the capacities and on the dates indicated.

Directors and Principal Officers of the registrant AWI:

Signature	Title	Date
/s/ Victor D. Grizzle Victor D. Grizzle	Director, President and Chief Executive Officer (Principal Executive Officer)	February 27, 2017
/s/ Brian L. MacNeal Brian L. MacNeal	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	February 27, 2017
/s/ Stephen F. McNamara Stephen F. McNamara	Vice President and Controller (Principal Accounting Officer)	February 27, 2017
/s/ Stanley A. Askren Stanley A. Askren	Director	February 27, 2017
/s/ Tao Huang Tao Huang	Director	February 27, 2017
/s/ Larry S. McWilliams Larry S. McWilliams	Director	February 27, 2017
/s/ James C. Melville James C. Melville	Director	February 27, 2017
/s/ James J. O'Connor	Director	February 27, 2017

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James J. O'Connor

/s/ John J. Roberts                      Director    February 27, 2017  
John J. Roberts

/s/ Gregory P. Spivy                      Director    February 27, 2017  
Gregory P. Spivy

/s/ Roy W. Templin                      Director    February 27, 2017  
Roy W. Templin

/s/ Cheryl T. Thomas                      Director    February 27, 2017  
Cheryl T. Thomas



## SCHEDULE II

## Armstrong World Industries, Inc., and Subsidiaries

## Valuation and Qualifying Reserves

(amounts in millions)

	Balance at beginning of year	Additions charged to earnings	Deductions	Balance at end of year
<b>2014</b>				
Provision for bad debts	\$ 2.5	\$ 1.5	\$ (0.5 )	\$ 3.5
Provision for discounts	5.7	19.1	(20.0 )	4.8
Provision for warranties	0.5	2.7	(3.0 )	0.2
Reserves for inventory	1.2	0.9	(0.8 )	1.3
<b>2015</b>				
Provision for bad debts	\$ 3.5	\$ 0.5	\$ (0.9 )	\$ 3.1
Provision for discounts	4.8	18.8	(20.3 )	3.3
Provision for warranties	0.2	2.0	(1.8 )	0.4
Reserves for inventory	1.3	1.4	(0.7 )	2.0
<b>2016</b>				
Provision for bad debts	\$ 3.1	\$ 2.4	\$ (1.5 )	\$ 4.0
Provision for discounts	3.3	18.2	(20.0 )	1.5
Provision for warranties	0.4	8.6	(8.4 )	0.6
Reserves for inventory	2.0	0.2	(0.8 )	1.4