

AIR PRODUCTS & CHEMICALS INC /DE/  
Form 10-K  
November 21, 2016  
Table of Contents

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

x **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 For the fiscal year ended 30 September 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 **1-4534**

**AIR PRODUCTS AND CHEMICALS, INC.**

**7201 Hamilton Boulevard  
Allentown, Pennsylvania, 18195-1501  
Tel. (610) 481-4911**

**State of incorporation: Delaware  
I.R.S. identification number: 23-1274455**

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

**Title of Each Class:**  
**Common Stock, par value \$1.00 per share**  
**2.0% Euro Notes due 2020**  
**.375% Euro Notes due 2021**  
**1.0% Euro Notes due 2025**

**Registered on:**  
**New York Stock Exchange**  
**New York Stock Exchange**  
**New York Stock Exchange**  
**New York Stock Exchange**

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

YES x NO ..

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

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES  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 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) 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.

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 voting stock held by non-affiliates of the registrant on 31 March 2016 was approximately \$31.0 billion. For purposes of the foregoing calculations all directors and/or executive officers have been deemed to be affiliates, but the registrant disclaims that any such director and/or executive officer is an affiliate.

The number of shares of common stock outstanding as of 31 October 2016 was 217,375,097.

### DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017 are incorporated by reference into Part III.

**Table of Contents**

**AIR PRODUCTS AND CHEMICALS, INC.**

**ANNUAL REPORT ON FORM 10-K**

**For the fiscal year ended 30 September 2016**

**TABLE OF CONTENTS**

ITEM 1.	<u>BUSINESS</u>	3
ITEM 1A.	<u>RISK FACTORS</u>	10
ITEM 1B.	<u>UNRESOLVED STAFF COMMENTS</u>	15
ITEM 2.	<u>PROPERTIES</u>	15
ITEM 3.	<u>LEGAL PROCEEDINGS</u>	16
ITEM 4.	<u>SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS</u>	18
ITEM 5.	<u>MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES</u>	18
ITEM 6.	<u>SELECTED FINANCIAL DATA</u>	20
ITEM 7.	<u>MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS</u>	22
ITEM 7A.	<u>QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK</u>	55
ITEM 8.	<u>FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA</u>	58
ITEM 9.	<u>CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE</u>	116
ITEM 9A.	<u>CONTROLS AND PROCEDURES</u>	116
ITEM 9B.	<u>OTHER INFORMATION</u>	116
ITEM 10.	<u>DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE</u>	116
ITEM 11.	<u>EXECUTIVE COMPENSATION</u>	117
ITEM 12.	<u>SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS</u>	117
ITEM 13.	<u>CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE</u>	118
ITEM 14.	<u>PRINCIPAL ACCOUNTANT FEES AND SERVICES</u>	118

ITEM 15.	<u>EXHIBITS AND FINANCIAL STATEMENT SCHEDULES</u>	118
	<u>SIGNATURES</u>	119

---

**Table of Contents**

**PART I**

**ITEM 1. BUSINESS**

**General Description of Business**

Air Products and Chemicals, Inc. ( we, our, us, the Company, Air Products, or registrant ), a Delaware corporation originally founded in 1940, serves energy, electronics, chemicals, metals, and manufacturing customers globally with a unique portfolio of products, services, and solutions that include atmospheric gases, process and specialty gases, electronics and performance materials, equipment, and services. The Company is the world's largest supplier of hydrogen and has built leading positions in growth markets such as helium, refinery hydrogen, semiconductor materials, natural gas liquefaction, and advanced coatings and adhesives. As used in this report, unless the context indicates otherwise, the terms we, our, us, the Company, or registrant include controlled subsidiaries, affiliates, predecessors of Air Products and its controlled subsidiaries and affiliates.

During its fiscal year ended 30 September 2016 ( fiscal year 2016 ), the Company manufactured and distributed products in two principal lines of business: Industrial Gases and Materials Technologies. Industrial Gases' primary products were atmospheric gases, process gases, and equipment for air separation. Materials Technologies' primary products were performance materials and chemicals, such as epoxy amine curing agents, polyurethane catalysts, additives, and specialty surfactants, and electronic materials such as specialty gases, chemical mechanical planarization slurries, and specialty chemicals. The Company also designs and manufactures equipment for natural gas liquefaction and helium distribution.

At the beginning of the fiscal year, the Company reported its business in seven reporting segments under which it managed its operations, assessed performance, and reported earnings: Industrial Gases - Americas; Industrial Gases - EMEA (Europe, Middle East, and Africa); Industrial Gases - Asia; Industrial Gases - Global; Materials Technologies; Energy-from-Waste; and Corporate and other. On 29 March 2016, the Board of Directors approved the Company's exit of its Energy-from-Waste business based on continued difficulties encountered in making its two Energy-from-Waste projects operational and the Company's conclusion, based on testing and analysis completed during the second quarter of fiscal year 2016, that significant additional time and resources would be required to make the projects operational. The Energy-from-Waste segment is now presented as a discontinued operation. Refer to Note 26, Business Segment and Geographic Information, to the consolidated financial statements for additional details on our reportable business segments.

On 16 September 2015, the Company announced that its Board of Directors approved a preliminary plan to spin off its Materials Technologies business, which contained the Electronic Materials and Performance Materials businesses. On 6 May 2016, the Company entered into an agreement to sell certain subsidiaries and assets comprising the Performance Materials business to Evonik Industries AG for \$3.8 billion in cash and the assumption of certain liabilities. The Company also announced its intention to proceed with the spin-off of the Electronic Materials business. In preparation for the spin-off, Air Products transferred operations, employees, assets, and liabilities of the Electronic Materials business to its wholly owned subsidiary, Versum Materials, Inc. (Versum). On 1 October 2016, Air Products distributed all of the shares of Versum Materials, Inc. to its shareholders, creating a new publicly traded corporation. As of 30 September 2016, the results of operations, financial condition, and cash flows for the Electronic Materials and Performance Materials businesses are presented within the Company's consolidated financial statements as continuing operations. Beginning with the first quarter of fiscal year 2017, the historical results of Electronic Materials will be presented as a discontinued operation. The historical results of Performance Materials will be reflected as a discontinued operation when it becomes probable for the sale to occur and actions required to meet the

plan of sale indicate that it is unlikely that significant changes will occur.

## Table of Contents

### Narrative Description of Business by Segments

#### Industrial Gases Business

The Company's Industrial Gases business produces atmospheric gases (oxygen, nitrogen, argon, and rare gases), process gases (hydrogen, helium, carbon dioxide, carbon monoxide, syngas and specialty gases) and equipment for the production or processing of gases such as air separation units and non-cryogenic generators. Atmospheric gases are produced through various air separation processes of which cryogenic is the most prevalent. Process gases are produced by methods other than air separation. For example, hydrogen is produced by steam methane reforming of natural gas or by purifying byproduct sources obtained from the chemical and petrochemical industries; and helium is produced as a byproduct of gases extracted from underground reservoirs, primarily natural gas, but also carbon dioxide purified before resale.

The Company's Industrial Gases business is organized and operated regionally. The regional Industrial Gases segments (Americas, EMEA, and Asia) supply gases and related equipment in the relevant region to diversified customers in many industries, including those in metals, glass, chemical processing, electronics, energy production and refining, food processing, metallurgical industries, medical, and general manufacturing. Hydrogen is used by refiners to facilitate the conversion of heavy crude feedstock and lower the sulfur content of gasoline and diesel fuels. The chemicals industry uses hydrogen, oxygen, nitrogen, carbon monoxide and syngas as feedstocks in the production of many basic chemicals. The energy production industry uses nitrogen injection for enhanced recovery of oil and natural gas and oxygen for gasification. Oxygen is used in combustion and industrial heating applications, including in the steel, certain nonferrous metals, glass and cement industries. Nitrogen applications are used in food processing for freezing and preserving flavor and nitrogen for inerting is used in various fields, including the metallurgical, chemical, and semiconductor industries. Helium is used in laboratories and healthcare for cooling and in other industries for pressurizing, purging and lifting. Argon is used in the metals and other industries for its unique inerting, thermal conductivity and other properties. Industrial gases are also used in welding and providing healthcare and are utilized in various manufacturing processes to make them more efficient and to optimize performance.

We distribute gases to our customers through a variety of supply modes:

**Liquid Bulk** Product is delivered in bulk (in liquid or gaseous form) by tanker or tube trailer and stored, usually in its liquid state, in equipment designed and installed typically by the Company at the customer's site for vaporizing into a gaseous state as needed. Liquid bulk sales are usually governed by three- to five-year contracts.

**Packaged Gases** Small quantities of product are delivered in either cylinders or dewars. The Company operates packaged gas businesses in Europe, Asia, and Latin America. In the United States, the Company's packaged gas business sells products only for the electronics and magnetic resonance imaging (principally helium) industries.

**On-Site Gases** Large quantities of hydrogen, nitrogen, oxygen, carbon monoxide, and syngas (a mixture of hydrogen and carbon monoxide) are provided to customers, principally the energy production and refining, chemical, and metallurgical industries worldwide who require large volumes of gases that have relatively constant demand. Gases are produced at large facilities located adjacent to customers' facilities or by pipeline systems from centrally located production facilities and are generally governed by 15- to 20- year contracts. The Company also delivers small quantities of product through small on-site plants (cryogenic or non-cryogenic generators), typically either via a 10- to 15- year sale of gas contract or through the sale of the equipment to the customer.

Electricity is the largest cost component in the production of atmospheric gases, and natural gas is the principal raw material for hydrogen, carbon monoxide, and syngas production. We mitigate energy and natural gas price

fluctuations contractually through pricing formulas, surcharges, and cost pass-through arrangements. During fiscal year 2016, no significant difficulties were encountered in obtaining adequate supplies of power and natural gas.

The regional Industrial Gases segments also include our share of the results of several joint ventures accounted for by the equity method. The largest of these joint ventures operate in Mexico, Italy, South Africa, India, Saudi Arabia, and Thailand.



## **Table of Contents**

Each of the regional Industrial Gases segments competes against three global industrial gas companies: Air Liquide S.A., Linde AG, and Praxair, Inc.; as well as regional competitors. Competition in Industrial Gases is based primarily on price, reliability of supply, and the development of industrial gas applications. In locations where we have pipeline networks, which enable us to provide reliable and economic supply of products to larger customers, we derive a competitive advantage.

Overall regional industrial gases sales constituted approximately 76% of consolidated sales in fiscal year 2016, 76% in fiscal year 2015, and 77% in fiscal year 2014. Sales of tonnage hydrogen and related products constituted approximately 17% of consolidated sales in fiscal year 2016, 19% in fiscal year 2015, and 22% in fiscal year 2014. Sales of atmospheric gases constituted approximately 36% of consolidated sales in fiscal year 2016, 35% in fiscal year 2015 and 33% in fiscal year 2014.

## **Industrial Gases Equipment**

The Company designs and manufactures equipment for air separation, hydrocarbon recovery and purification, natural gas liquefaction (LNG), and liquid helium and liquid hydrogen transport and storage. The Industrial Gases Global segment includes cryogenic and non-cryogenic equipment for air separation. The equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery, and processing and steel and primary metals processing. Other activities, which are managed globally instead of regionally, are also part of this segment, such as technology development for air separation. The Corporate and other segment includes two global equipment businesses, our LNG sale of equipment business and our liquid helium and liquid hydrogen transport and storage containers business. Steel, aluminum, and capital equipment subcomponents (compressors, etc.) are the principal raw materials in the manufacturing of equipment in this business segment. Adequate raw materials for individual projects are acquired under firm purchase agreements. Equipment is produced at the Company's manufacturing sites with certain components being procured from subcontractors and vendors. Competition in the equipment business is based primarily on technological performance, service, technical know-how, price and performance guarantees.

The backlog of equipment orders was approximately \$1.1 billion on 30 September 2016 (as compared with a total backlog of approximately \$1.5 billion on 30 September 2015) and primarily contains Air Products' share of the multi-year contract with a joint venture in Jazan, Saudi Arabia for the construction of an industrial gas facility that will supply gases to Saudi Arabian Oil Company (Saudi Aramco). Revenue from this contract is recognized under the percent complete method based on costs incurred to date compared with total expected costs to be incurred. The Company estimates that between 60-70% of the total sales backlog as of 30 September 2016 will be recognized as revenue during fiscal year 2017, dependent on execution schedules of the relevant projects.

## **Materials Technologies**

Materials Technologies is a global business that delivers innovation-driven solutions for specific customer applications within niche markets. This segment employs applications technology to provide solutions to a broad range of global industries through chemical synthesis, analytical technology, process engineering, and surface science. It is comprised of two business divisions: Performance Materials, which is focused on a portfolio of additives products that provide high value properties at low cost across a variety of industries, and Electronic Materials, which is focused on supplying critical materials and equipment to the semiconductor industry. The Company completed the spin-off of the Electronic Materials business on 1 October 2016 and has entered into an agreement for the sale of the Performance Materials business, which is subject to regulatory approval and other conditions.

The Performance Materials business has critical competencies in specialty amines, alkoxyates and silicone chemistries. The business provides a range of products concentrated in the areas of epoxy curing agents, accelerators and catalysts, polyurethane catalysts, surfactants and curatives and specialty additives, including surfactants, wetting agents, dispersants and de-foaming agents. The products are used in a variety of industry applications, including coatings, inks, adhesives, construction and civil engineering, personal care, institutional and industrial cleaning, mining, oil refining, and polyurethanes. The Performance Materials businesses focus on the development of new additive materials aimed at providing unique technologies and functionality.

The Electronic Materials business maintained critical competencies in molecular design, formulation expertise, and ultra-high purity chemistry. This division provided the semiconductor industry with high purity process materials for deposition, metallization, chamber cleaning and etching, chemicals mechanical planarization slurries,

## **Table of Contents**

organosilanes, organometalics and liquid dopants for thin film deposition, formulated chemical products for post-etch cleaning and delivery equipment and services primarily for the manufacture of silicon and compound semiconductors and thin film transistor liquid crystal displays.

Both businesses are based on strong customer relationships and collaborative development, technology and innovation leadership, unique product positioning, and a strong global infrastructure with in-region flexible manufacturing capabilities. The segment maintains manufacturing operations in North America, Europe and Asia and manages a complex global supply chain. Products are delivered in bulk containers of different sizes, some of which are returnable.

Materials Technologies uses a wide variety of raw materials including amines and amine derivatives, alcohols and surfactants, tungsten powder, ethylene oxide, and ketones. During fiscal year 2016, no significant difficulties were encountered in obtaining adequate supplies of energy or raw materials.

Materials Technologies faces competition on a product-by-product basis against competitors ranging from niche suppliers with a single product to larger and more vertically integrated companies. Competition is principally conducted on the basis of price, quality, product performance, reliability of product supply, technical innovation, service, and global infrastructure.

Total sales from Materials Technologies constituted approximately 21% of consolidated sales in fiscal year 2016, 21% of consolidated sales in fiscal year 2015, and 20% in fiscal year 2014. Performance Materials Division sales constituted approximately 11% of consolidated sales in fiscal year 2016, 11% in fiscal year 2015, and 11% in fiscal year 2014, and Electronic Materials Division sales constituted approximately 10% of consolidated sales in fiscal year 2016, 10% of consolidated sales in fiscal year 2015, and 9% in fiscal year 2014.

## **Narrative Description of the Company's Business Generally**

The Company, through subsidiaries, affiliates, and less-than-controlling interests, conducts business in 50 countries outside the United States. Its international businesses are subject to risks customarily encountered in foreign operations, including fluctuations in foreign currency exchange rates and controls; import and export controls; and other economic, political, and regulatory policies of local governments.

The Company has majority or wholly owned foreign subsidiaries that operate in Canada, 17 European countries (including the United Kingdom, the Netherlands, and Spain), 11 Asian countries (including China, Korea, and Taiwan), 7 Latin American countries (including Chile and Brazil), 2 African countries, and 1 Middle Eastern country. The Company also owns less-than-controlling interests in entities operating in Europe, Asia, Africa, the Middle East, and Latin America (including Italy, Germany, China, India, Saudi Arabia, Singapore, Thailand, United Arab Emirates, South Africa, and Mexico).

Financial information about the Company's foreign operations and investments is included in Note 8, Summarized Financial Information of Equity Affiliates; Note 23, Income Taxes; and Note 26, Business Segment and Geographic Information, to the consolidated financial statements included under Item 8, herein. Information about foreign currency translation is included under Foreign Currency in Note 1, Major Accounting Policies, and information on the Company's exposure to currency fluctuations is included in Note 13, Financial Instruments, to the consolidated financial statements, included under Item 8, below, and in Foreign Currency Exchange Rate Risk, included under Item 7A, below. Export sales from operations in the United States to third-party customers amounted to \$307.7 million, \$398.8 million, and \$378.7 million in fiscal years 2016, 2015, and 2014, respectively.

## **Technology Development**

The Company pursues a market-oriented approach to technology development through research and development, engineering, and commercial development processes. It conducts research and development principally in its laboratories located in the United States (Trexlerstown, Pennsylvania; Carlsbad, California; Milton, Wisconsin; and Phoenix, Arizona), Canada (Vancouver), the United Kingdom (Basingstoke and Carrington), Germany (Hamburg), the Netherlands (Utrecht), Spain (Barcelona), Japan (Kawasaki), China (Shanghai), Korea (Giheung), and Taiwan (Chupei and Hsinchu City). The Company also funds and cooperates in research and development programs conducted by a number of major universities and undertakes research work funded by others principally the United States government.

The Company's research groups are aligned with and support the research efforts of various businesses throughout the Company. Development of technology for use within the Industrial Gases business focuses

## **Table of Contents**

primarily on new and improved processes and equipment for the production and delivery of industrial gases and new or improved applications for industrial gas products. Research and technology development for Materials Technologies supports development of new products and applications to strengthen and extend the Company's present positions as well as to lower processing costs and develop new processes for the new products.

Research and development expenditures were \$132.0 million during fiscal year 2016, \$137.1 million during fiscal year 2015, and \$139.8 million in fiscal year 2014. In addition, the Company expended approximately \$1 million on customer sponsored research activities during fiscal year 2016, \$6 million during fiscal year 2015, and \$19 million in fiscal year 2014.

The Company owns approximately 970 United States patents, approximately 3,900 foreign patents, and is a licensee under certain patents owned by others. While the patents and licenses are considered important, the Company does not consider its business as a whole to be materially dependent upon any particular patent, patent license, or group of patents or licenses.

## **Environmental Controls**

The Company is subject to various environmental laws and regulations in the countries in which it has operations. Compliance with these laws and regulations results in higher capital expenditures and costs. In the normal course of business, the Company is involved in legal proceedings under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA: the federal Superfund law); Resource Conservation and Recovery Act (RCRA); and similar state and foreign environmental laws relating to the designation of certain sites for investigation or remediation. Additional information with respect to these proceedings is included under Item 3, Legal Proceedings, below. The Company's accounting policy for environmental expenditures is discussed in Note 1, Major Accounting Policies, and environmental loss contingencies are discussed in Note 17, Commitments and Contingencies, to the consolidated financial statements, included under Item 8, below.

The amounts charged to income from continuing operations related to environmental matters totaled \$27.0 million in fiscal year 2016, \$28.3 million in fiscal 2015, and \$35.1 million in 2014. These amounts represent an estimate of expenses for compliance with environmental laws and activities undertaken to meet internal Company standards. Refer to Note 17, Commitments and Contingencies, to the consolidated financial statements for additional information.

The Company estimates that we spent \$7 million in 2016, \$4 million in 2015 and \$5 million in 2014 on capital projects to control pollution. Capital expenditures to control pollution in future years are estimated to be approximately \$3 million in both 2017 and 2018.

## **Employees**

On 30 September 2016, the Company (including majority-owned subsidiaries) had approximately 18,600 employees, of whom approximately 18,300 were full-time employees and of whom approximately 11,800 were located outside the United States. The Company has collective bargaining agreements with unions at various locations that expire on various dates over the next four years. The Company considers relations with its employees to be satisfactory.

## **Available Information**

All periodic and current reports, registration statements, and other filings that the Company is required to file with the Securities and Exchange Commission (SEC), including the Company's annual report on Form 10-K, quarterly reports

on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) of the Securities Exchange Act of 1934 (the 1934 Act Reports), are available free of charge through the Company's Internet website at [www.airproducts.com](http://www.airproducts.com). Such documents are available as soon as reasonably practicable after electronic filing of the material with the SEC. All 1934 Act Reports filed during the period covered by this report were available on the Company's website on the same day as filing.

The public may also read and copy any materials filed by the Company with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains an Internet site that contains reports, proxy, and information statements, and other information regarding issuers that file electronically with the SEC. The address of that site is [www.sec.gov](http://www.sec.gov).

## **Table of Contents**

### **Seasonality**

Although the Company's businesses are not subject to seasonal fluctuations to any material extent, Materials Technologies is susceptible to the cyclical nature of the electronics industry and to seasonal fluctuations in underlying end-use performance materials markets.

### **Working Capital**

Our working capital balance was a positive \$1,034 at 30 September 2016. The cash and cash items balance is higher than our historical trend and primarily results from transactions related to the anticipated spin-off of Versum and positive operating cash flows.

The Company maintains inventory where required to facilitate the supply of products to customers on a reasonable delivery schedule. Industrial Gases' inventory consists primarily of industrial gas, specialty gas, and crude helium inventories supplied to customers through liquid bulk and packaged gases supply modes. Materials Technologies inventories consist primarily of bulk and packaged specialty gases and chemicals, bulk and packaged performance chemical solutions and also include inventories to support sales of equipment and services.

### **Customers**

We do not have a homogeneous customer base or end market, and no single customer accounts for more than 10% of our consolidated revenues. We do have concentrations of customers in specific industries, primarily refining, chemicals, and electronics. Within each of these industries, the Company has several large-volume customers with long-term contracts. A negative trend affecting one of these industries, or the loss of one of these major customers, although not material to our consolidated revenue, could have an adverse impact on the affected segment.

### **Governmental Contracts**

No segment's business is subject to a government entity's renegotiation of profits or termination of contracts that would be material to our business as a whole.

**Table of Contents****Executive Officers of the Company**

The Company's executive officers and their respective positions and ages on 21 November 2016 follow. Information with respect to offices held is stated in fiscal years.

<b>Name</b>	<b>Age</b>	<b>Office</b>
M. Scott Crocco	52	Executive Vice President and Chief Financial Officer (became Executive Vice President and Chief Financial Officer in 2016; Senior Vice President and Chief Financial Officer in 2013; and Vice President and Corporate Controller in 2008).
Russell A. Flugel	47	Vice President, Corporate Controller and Principal Accounting Officer (became Vice President, Corporate Controller and Principal Accounting Officer in 2015; Corporate Controller in 2014; Director, Accounting and Corporate Decision Support in 2013; and Director, Corporate Decision Support, Technical Accounting and Consolidation in 2011).
Seifi Ghasemi	72	Chairman, President, and Chief Executive Officer (became Chairman, President and Chief Executive Officer in 2014 and Chairman and Chief Executive Officer of Rockwood Holdings, Inc. in 2001). Mr. Ghasemi is a member and Chairman of the Board of Directors and the Chairman of the Executive Committee of the Board of Directors.
Jennifer L. Grant	44	Vice President and Chief Human Resources Officer (became Vice President and Chief Human Resources Officer in 2013). Prior to joining Air Products, was Vice President of Human Resources for Pfizer Inc. Specialty Products and Oncology Divisions from 2009-2013.
Corning F. Painter	54	Executive Vice President Industrial Gases (became Executive Vice President Industrial Gases in 2015; Senior Vice President and General Manager Merchant Gases in 2014; Senior Vice President Supply Chain in 2012; Senior Vice President Corporate Strategy and Technology in 2011; and Vice President and General Manager, Global Electronics in 2007).



## Table of Contents

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

In conjunction with evaluating an investment in the Company and the forward-looking information contained in this Annual Report on Form 10-K or presented elsewhere by management from time to time, you should carefully read the following risk factors. Any of the following risks could have a material adverse effect on our business, operating results, financial condition, and the actual outcome of matters as to which forward-looking statements are made and could adversely affect the value of an investment in our common stock as well. While we believe we have identified and discussed below the key risk factors affecting our business, there may be additional risks and uncertainties that adversely affect our business, performance, or financial condition in the future that are not presently known, are not currently believed to be significant, or are not identified below because they are common to all businesses.

**Overall Economic and Supply/Demand Conditions, Customer Vitality** A weakening economy or product supply versus demand imbalance in markets in which the Company does business may decrease the demand for its goods and services and adversely impact its revenues, operating results, and cash flows. Cyclical downturns in the industries served by our customers or adverse economic events or conditions affecting specific customers can in turn have an adverse effect on our business.

Demand for the Company's products and services depends in part on the general economic conditions affecting the countries and markets in which the Company does business. In the past few years, uncertain economic conditions in certain geographies and changing supply and demand balances in markets served by the Company have impacted and may in the future impact demand for the Company's products and services, in turn negatively impacting the Company's revenues and earnings. Unfavorable conditions can depress sales in a given market or to a particular customer, affect our margins, constrain our operating flexibility, impact utilization of the Company's manufacturing capacity, or result in charges which are unusual or nonrecurring. Excess capacity in the Company's or its competitors' manufacturing facilities could decrease the Company's ability to maintain pricing and generate profits.

Our operating results in one or more segments may also be affected by uncertain or deteriorating economic conditions particularly germane to that segment or to particular customer markets within that segment. A decline in the industries served by our customers or adverse events or circumstances affecting individual customers can impair the ability of such customers to satisfy their obligations to the Company, resulting in uncollected receivables, unanticipated contract terminations, project delays, or inability to recover plant investments negatively impacting our financial results.

Weak overall demand or specific customer conditions may also cause elimination of product lines, customer shutdowns or default, or other inability to profitably operate facilities and may force sale or abandonment of facilities and equipment or projects not to reach on-stream. These or other events associated with weak economic conditions or specific end market, product, or customer events may require the Company to record an impairment on tangible assets, such as facilities and equipment, or intangible assets, such as intellectual property or goodwill, which would have a negative impact on its financial results.

**Operational, Economic, Political, and Legal Risks of International Operations** The Company's foreign operations can be adversely impacted by operational, economic, political and legal risks that could impact our profitability. Developing market operations present special risks.

The Company has extensive international operations. In addition, the Company is actively investing significant capital and other resources in emerging markets, including joint ventures and other alliances. The Company's operations in certain foreign jurisdictions may be subject to project delays due to unanticipated government actions, inadequate investment in infrastructure, undeveloped property rights and legal systems, or political instability. Some of the Company's contractual relationships within these jurisdictions are subject to cancellation without full compensation for loss. Economic and political conditions within foreign jurisdictions, nationalization and expropriation risk, social

unrest, strained relations between countries, or imposition of international sanctions can cause fluctuations in demand, price volatility, supply disruptions, or loss of property. The occurrence of any of these risks could have a material adverse impact on the Company's financial condition, results of operation, and cash flows.

Our developing market operations may be subject to greater risks than those faced by our operations in mature economies, including geopolitical, legal, economic, and talent risks. Our success will depend, in part, on our ability

## **Table of Contents**

to manage the risks inherent in operating in a developing market, including unfamiliar regulatory environments, relationships with local partners, language and cultural differences, and tailoring products for acceptance by local markets.

Further, our operations outside the United States require us to comply with a number of United States and international regulations, including anti-corruption laws such as the United States Foreign Corrupt Practices Act, the United Kingdom Bribery Act, and the China Anti-Unfair Competition Law, as well as U.S. and international economic sanctions. We have policies and procedures to foster compliance with these laws, including compliance and training programs for our employees and established due diligence procedures with regard to third parties; however, these cannot eliminate the risk that violations could be committed by our employees, agents or joint venture partners. Violations of such laws and regulations could result in disruptive investigations of the Company, significant fines and sanctions which could adversely affect our consolidated results of operations.

### **Currency Fluctuations Changes in foreign currencies may adversely affect the Company's financial results.**

The majority of the Company's revenue is generated from sales outside the United States, exposing it to fluctuations in foreign currency exchange rates. Our Industrial Gases business is primarily exposed to translational currency risk as the results of its foreign operations are translated into U.S. dollars at current exchange rates throughout the fiscal period. Our Performance Materials business is also significantly exposed to transactional currency impacts as many of its products are manufactured in one country and sold in another.

The Company uses certain financial instruments to mitigate some of these effects. The Company's policy is to minimize cash flow volatility from changes in currency exchange rates. The Company chooses not to hedge the translation of its foreign subsidiaries' earnings into dollars. Accordingly, reported sales, net earnings, cash flows, and fair values have been and in the future will be affected by changes in foreign exchange rates. For a more detailed discussion of currency exposure, see Item 7A, below.

### **Raw Material and Energy Cost and Availability Interruption in ordinary sources of supply or an inability to recover increases in energy and raw material costs from customers could result in lost sales or reduced profitability.**

Hydrocarbons, including natural gas, are the primary feedstock for the production of hydrogen, carbon monoxide, and syngas. Energy, including electricity, natural gas, and diesel fuel for delivery trucks, is the largest cost component of the Company's business. Because the Company's industrial gas facilities use substantial amounts of electricity, energy price fluctuations could materially impact the Company's revenues and earnings. A disruption in the supply of energy, components, or raw materials, whether due to market conditions, legislative or regulatory actions, natural events, or other disruption, could prevent the Company from meeting its contractual commitments, harming its business and financial results.

The Company's supply of crude helium for purification and resale is largely dependent upon natural gas production by crude helium suppliers. Lower natural gas production (which may result from natural gas pricing or supplier operating issues) or interruptions in sales from other crude helium suppliers, can reduce the Company's supplies of crude helium available for processing and resale to its customers.

The Company typically contracts to pass through cost increases in energy and raw materials to its customers, but cost variability can still have a negative impact on its results. The Company may not be able to raise prices as quickly as costs rise, or competitive pressures may prevent full recovery. Increases in energy or raw material costs that cannot be passed on to customers for competitive or other reasons would negatively impact the Company's revenues and

earnings. Even where costs are passed through, price increases can cause lower sales volume.

**Regulatory Compliance** The Company is subject to extensive government regulation in jurisdictions around the globe in which it does business. Changes in regulations addressing, among other things, environmental compliance, import/export restrictions, anti-bribery and corruption, and taxes, can negatively impact the Company's financial condition, results of operation, and cash flows.

The Company is subject to government regulation in the United States and foreign jurisdictions in which it conducts its business. The application of laws and regulations to the Company's business is sometimes unclear.

## **Table of Contents**

Compliance with laws and regulations may involve significant costs or require changes in business practice that could result in reduced profitability. Determination of noncompliance can result in penalties or sanctions that could also impact financial results. Compliance with changes in laws or regulations can require additional capital expenditures or increase operating costs. Export controls or other regulatory restrictions could prevent the Company from shipping its products to and from some markets or increase the cost of doing so. Export restrictions continue to attract external focus by multiple customs and export enforcement authorities. Changes in tax laws and regulations and international tax treaties could affect the financial results of the Company's businesses. Increasingly aggressive enforcement of anti-bribery and anti-corruption requirements, including the U.S. Foreign Corrupt Practices Act, the United Kingdom Bribery Act and the China Anti-Unfair Competition Law, could subject the Company to criminal or civil sanctions if a violation occurs.

### **Environmental Compliance Costs and expenses resulting from compliance with environmental regulations may negatively impact the Company's operations and financial results.**

The Company is subject to extensive federal, state, local, and foreign environmental and safety laws and regulations concerning, among other things, emissions in the air; discharges to land and water; and the generation, handling, treatment, and disposal of hazardous waste and other materials. The Company takes its environmental responsibilities very seriously, but there is a risk of environmental impact inherent in our manufacturing operations and transportation of chemicals. Future developments and more stringent environmental regulations may require the Company to make additional unforeseen environmental expenditures. In addition, laws and regulations may require significant expenditures for environmental protection equipment, compliance, and remediation. These additional costs may adversely affect financial results. For a more detailed description of these matters, see Narrative Description of the Company's Business Generally Environmental Controls, above.

### **We may not be able to successfully control or reduce costs to improve productivity and streamline operations. Reorganization and cost reduction efforts can disrupt operations.**

Achieving our financial goals including continued profitability and margin growth depends significantly on our efforts to control or reduce our operating costs, including our ability to eliminate stranded costs related to our divested businesses. Because many of our costs are affected by factors outside or substantially outside our control, we generally must seek to control or reduce costs through operating efficiency and repositioning actions. If we are not able to identify and execute efforts designed to control or reduce costs and increase operating efficiency, our ability to attain our goals could be adversely impacted.

Ongoing restructuring and cost reduction actions may reduce our available talent and other resources, impact our ability to attract and retain key employees, slow improvements in our products and services, and adversely affect our ability to respond to customers. Failure to achieve targeted improvements may diminish the operational and financial benefits we realize from such actions. These circumstances could adversely impact our business and financial statements.

### **Interest Rate Increases The Company's earnings, cash flows, and financial position can be impacted by interest rate increases and access to credit.**

At 30 September 2016, the Company had total consolidated debt of \$6,225.2 million (including Versum debt of \$997.2 million), of which \$1,307.1 million (including Versum debt of \$5.8 million) will mature in the next twelve months. The Company expects to continue to incur indebtedness to fund new projects and replace maturing debt. Although the Company actively manages its interest rate risk through the use of derivatives and diversified debt obligations, not all borrowings at variable rates are hedged, and new debt will be priced at market rates. If interest

rates increase, the Company's interest expense could increase significantly, affecting earnings and reducing cash flow available for working capital, capital expenditures, acquisitions, and other purposes. In addition, changes by any rating agency to the Company's outlook or credit ratings could increase the Company's cost of borrowing and weaken our ability to access capital and credit markets on terms commercially acceptable to us. For a more detailed discussion of interest rate risk, see Item 7A, below.

**We may be unable to successfully execute or effectively integrate acquisitions, and divestitures may not occur as planned.**

We regularly review our portfolio of businesses and pursue growth through acquisitions and seek to divest non-core businesses. We may not be able to complete transactions on favorable terms, on a timely basis or at all. In

## **Table of Contents**

addition, our results of operations and cash flows may be adversely impacted by the failure of acquired businesses to meet expected returns, the failure to integrate acquired businesses, the inability to dispose of non-core assets and businesses on satisfactory terms and conditions, and the discovery of unanticipated liabilities or other problems in acquired businesses for which we lack contractual protections or insurance. With respect to divested businesses, our results may be impacted by claims by purchasers to whom we have provided contractual indemnification.

### **Catastrophic Events Catastrophic events could disrupt the Company's operations or the operations of its suppliers or customers, having a negative impact on the Company's business, financial results, and cash flows.**

The Company's operations could be impacted by catastrophic events outside the Company's control, including severe weather conditions such as hurricanes, floods, earthquakes, storms, epidemics, or acts of war and terrorism. Any such event could cause a serious business disruption that could affect the Company's ability to produce and distribute its products and possibly expose it to third-party liability claims. Additionally, such events could impact the Company's suppliers or customers, in which event energy and raw materials may be unavailable to the Company, or its customers may be unable to purchase or accept the Company's products and services. Any such occurrence could have a negative impact on the Company's operations and financial results.

### **Operational Risks Operational and execution risks may adversely affect the Company's operations or financial results.**

The Company's operation of its facilities, pipelines, and delivery systems inherently entails hazards that require continuous oversight and control, such as pipeline leaks and ruptures, fire, explosions, toxic releases, mechanical failures, or vehicle accidents. If operational risks materialize, they could result in loss of life, damage to the environment, or loss of production, all of which could negatively impact the Company's ongoing operations, reputation, financial results, and cash flows. In addition, the Company's operating results are dependent on the continued operation of its production facilities and its ability to meet customer requirements, which depends, in part, on the Company's ability to properly maintain and replace aging assets. Operating results are also dependent on the Company's ability to complete new construction projects on time, on budget, and in accordance with performance requirements, which depends, in part, on the availability of adequate sources of labor in the geographies where the Company intends to build new plants. Failure to do so may expose the Company to loss of revenue, potential litigation, and loss of business reputation.

### **Information Security The security of the Company's Information Technology systems could be compromised, which could adversely affect its ability to operate.**

We depend on information technology to enable us to operate efficiently and interface with customers as well as to maintain financial accuracy and efficiency. Our information technology capabilities are delivered through a combination of internal and external services and services providers. If we do not allocate and effectively manage the resources necessary to build and sustain the proper technology infrastructure, we could be subject to transaction errors, processing inefficiencies, the loss of customers, business disruptions, or the loss of or damage to our confidential business information or multiple site impact through a security breach. As with all large systems, our information systems could be penetrated by outside parties intent on extracting information, corrupting information, disrupting business processes, or causing harm to persons or property. The Company's systems have in the past been and likely will in the future be subject to sophisticated cyber security threats. To date, the Company is not aware of any significant impact on its operations or financial results from such attempts; however, unauthorized access could disrupt our business operations, result in the loss of assets, and have a material adverse effect on our business, financial condition, or results of operations.

The Company's business involves the use, storage, and transmission of information about its employees, vendors, and customers. The protection of such information, as well as the Company's information, is critical to the Company. The regulatory environment surrounding information security and privacy is increasingly demanding, with the frequent imposition of new and constantly changing requirements. The Company has established policies and procedures to help protect the security and privacy of this information. The Company also, from time to time, exports sensitive customer data and technical information to recipients outside the United States. Breaches of our security measures or the accidental loss, inadvertent disclosure, or unapproved dissemination of proprietary information or sensitive or confidential data about us or our customers, including the potential loss or disclosure of such information or data as a result of fraud, trickery, or other forms of deception,



## **Table of Contents**

could expose us, our customers, or the individuals affected to a risk of loss or misuse of this information, result in litigation and potential liability for us, damage our reputation, or otherwise harm our business.

### **Litigation and Regulatory Proceedings The Company's financial results may be affected by various legal and regulatory proceedings, including those involving antitrust, tax, environmental, or other matters.**

The Company is subject to litigation and regulatory investigations and proceedings in the normal course of business and could become subject to additional claims in the future, some of which could be material. While the Company seeks to limit its liability in its commercial contractual arrangements, there are no guarantees that each contract will contain suitable limitations of liability or that limitations of liability will be enforceable at law. Also, the outcome of existing legal proceedings may differ from the Company's expectations because the outcomes of litigation, including regulatory matters, are often difficult to predict reliably. Various factors or developments can lead the Company to change current estimates of liabilities and related insurance receivables, where applicable, or make such estimates for matters previously not susceptible to reasonable estimates, such as a significant judicial ruling or judgment, a significant settlement, significant regulatory developments, or changes in applicable law. A future adverse ruling, settlement, or unfavorable development could result in charges that could have a material adverse effect on the Company's financial condition, results of operations, and cash flows in any particular period.

### **Greenhouse Gases Legislative and regulatory responses to global climate change create financial risk.**

Some of the Company's operations are within jurisdictions that have or are developing regulatory regimes governing emissions of greenhouse gases (GHG). These include existing coverage under the European Union Emission Trading Scheme, California's cap and trade scheme, Alberta's Emission Reduction Program, China's Emission Trading Scheme pilots, South Korea's Emission Trading Scheme, and mandatory reporting and anticipated constraints on GHG emissions under an Ontario cap and trade scheme, nation-wide expansion of the China Emission Trading Scheme, and federal emission performance standards in Canada. In addition, the U.S. Environmental Protection Agency (EPA) requires mandatory reporting of GHG emissions and is regulating GHG emissions for new construction and major modifications to existing facilities. Moreover, some jurisdictions have various mechanisms to target the power sector (e.g. U.S. EPA Clean Power Plan) to achieve emission reductions. These reductions often result in higher power costs.

Increased public concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHG. Although uncertain, these developments could increase the Company's costs related to consumption of electric power, hydrogen production, and fluorinated gases production. The Company believes it will be able to mitigate some of the increased costs through its contractual terms, but the lack of definitive legislation or regulatory requirements prevents an accurate estimate of the long-term impact on the Company. Any legislation that limits or taxes GHG emissions could impact the Company's growth, increase its operating costs, or reduce demand for certain of its products.

### **The results of the United Kingdom's ( UK ) European Union ( EU ) membership referendum could adversely affect customer demand, our relationships with customers and suppliers and our business and financial statements.**

The results of the UK's EU membership referendum, advising for the exit of the UK from the EU, has caused and may continue to cause significant volatility in global stock markets, currency exchange rate fluctuations and global economic uncertainty, which could adversely affect customer demand, our relationships with customers and suppliers and our business and financial statements.

**Competition Inability to compete effectively in a segment could adversely impact sales and financial performance.**

The Company faces strong competition from several large global competitors and many smaller regional ones in many of its business segments. Introduction by competitors of new technologies, competing products, or additional capacity could weaken demand for or impact pricing of the Company's products, negatively impacting financial results. In addition, competitors' pricing policies could affect the Company's profitability or its market share.

## **Table of Contents**

### **We could incur significant liability if the distribution of Versum common stock to our stockholders is determined to be a taxable transaction.**

We have received an opinion from outside tax counsel to the effect that the spin-off of Versum qualifies as a transaction that is described in Sections 355(a) and 368(a)(1)(D) of the Internal Revenue Code. The opinion relies on certain facts, assumptions, representations and undertakings from Versum and us regarding the past and future conduct of the companies' respective businesses and other matters. If any of these facts, assumptions, representations or undertakings are incorrect or not satisfied, our shareholders and we may not be able to rely on the opinion of tax counsel and could be subject to significant tax liabilities. Notwithstanding the opinion of tax counsel we have received, the IRS could determine on audit that the spin-off is taxable if it determines that any of these facts, assumptions, representations or undertakings are not correct or have been violated or if it disagrees with the conclusions in the opinion. If the spin-off is determined to be taxable for U.S. federal income tax purposes, our shareholders that are subject to U.S. federal income tax and we could incur significant U.S. federal income tax liabilities.

### **ITEM 1B. UNRESOLVED STAFF COMMENTS**

We have not received any written comments from the Commission staff that remain unresolved.

### **ITEM 2. PROPERTIES**

Air Products and Chemicals, Inc. owns its principal administrative offices, which are the Company's headquarters located in Trexlertown, Pennsylvania, as well as Hersham, England and Santiago, Chile. The Company leases administrative offices in Spain, Malaysia, and China for its Global Business Support organization.

The following is a description of the properties used by our six business segments and the Energy-from-Waste business discontinued operation. We believe that our facilities are suitable and adequate for our current and anticipated future levels of operation.

#### **Industrial Gases Global**

Management, sales, and engineering support for this business segment is based in our principal administrative offices noted above, and an office in India.

Air separation equipment is manufactured in Missouri, Pennsylvania, and China.

Research and development (R&D) activities for this business segment are conducted at owned locations in the U.S. and the United Kingdom, and 4 leased locations in Canada, Europe, and Asia.

Helium is processed at multiple sites in the U.S. and then distributed to/from transfill sites globally.

#### **Industrial Gases Americas**

This business segment currently operates from over 295 production and distribution facilities in North and South America (approximately 1/4<sup>th</sup> of which are located on owned property), and 10% of which are integrated sites that serve dedicated customers as well as merchant customers. The Company has sufficient property rights and permits for

the ongoing operation of our pipeline systems in the Gulf Coast, California, and Arizona in the United States and Alberta and Ontario, Canada. Management and sales support is based in our Trexlertown and Santiago offices referred to above, and at 10 leased properties located throughout North and South America.

Hydrogen fueling stations built by the Company support commercial markets in California and Japan as well as demonstration projects in Europe and other parts of Asia.

### **Industrial Gases EMEA**

This business segment currently operates from over 150 production and distribution facilities in Europe, the Middle East, and Africa (approximately 1/3<sup>rd</sup> of which are on owned property). The Company has sufficient property rights and permits for the ongoing operation of our pipeline systems in the Netherlands, the United Kingdom, Belgium, France, and Germany. Management and sales support for this business segment is based in Hersham, England referred to above, Barcelona, Spain and at 12 leased office sites located throughout the region.

## **Table of Contents**

### **Industrial Gases Asia**

Industrial Gases Asia currently operates from over 150 production and distribution facilities within Asia (approximately 1/4<sup>th</sup> of which are on owned property or long duration term grants). The Company has sufficient property rights and permits for the ongoing operation of our pipeline systems in China, Korea, Taiwan, Malaysia, Singapore, and Indonesia. Management and sales support for this business segment is based in Shanghai, China and Kuala Lumpur, Malaysia, and in 7 leased office locations throughout the region.

### **Materials Technologies**

This business segment was comprised of two divisions, Electronic Materials and Performance Materials, prior to the 1 October 2016 spin-off of Electronic Materials.

The Electronic Materials portion of this segment was spun off into the separate legal entity, Versum Materials, Inc., along with its production, equipment manufacturing, and distribution operations at 24 sites in the United States, Europe, and Asia (1/3rd of which are owned sites, and the remainder of which are on leased sites or on sites where long duration term grants have been obtained).

The headquarters for this new entity will be based in Tempe, Arizona with supporting administration and research and development activities at 4 locations in Taiwan, 2 locations in South Korea, Singapore, China, the Netherlands, and Pennsylvania in the United States.

The Performance Materials portion of this segment is under an announced Purchase Agreement for the sale of this division, including its operations at 12 production sites globally, 50% of which are owned.

This segment conducts R&D related activities at 8 locations worldwide, including: Pennsylvania, California, and Wisconsin in the United States, the Netherlands, China, Japan, and multiple sites in Germany.

The management and sales support for Performance Materials is currently based in our Trexlertown offices referred to above, and at offices located in Utrecht, the Netherlands, Shanghai, China, Kawasaki, Japan, and Singapore.

### **Corporate and other**

Corporate administrative functions are based in the Company's administrative offices referred to above.

The Gardner Cryogenic business operates at facilities in Pennsylvania and Kansas in the United States and in France.

The LNG business has owned manufacturing facilities in Pennsylvania and Florida in the United States with management, engineering, and sales support based in the Trexlertown offices referred to above and a nearby leased office.

### **Energy-from-Waste**

On 29 March 2016, the Board of Directors approved the Company's exit of its Energy-from-Waste business. As a result, the Energy-from-Waste segment is presented as a discontinued operation. The real estate interests for this business, which are comprised of a leased office, two leased production sites, and rights for utility infrastructure, will be exited with the assets of this business.

**ITEM 3. LEGAL PROCEEDINGS**

In the normal course of business, the Company and its subsidiaries are involved in various legal proceedings, including contract, product liability, intellectual property, insurance, and regulatory matters. Although litigation with respect to these matters is routine and incidental to the conduct of our business, such litigation could result in large monetary awards, especially if a civil jury is allowed to determine compensatory and/or punitive damages. However, we believe that litigation currently pending to which we are a party will be resolved without any material adverse effect on our financial position, earnings, or cash flows.

From time to time, we are also involved in proceedings, investigations, and audits involving governmental authorities in connection with environmental, health, safety, competition, and tax matters.

The Company is a party to proceedings under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA: the federal Superfund law); Resource Conservation and Recovery Act (RCRA); and similar

**Table of Contents**

state and foreign environmental laws relating to the designation of certain sites for investigation or remediation. Presently there are approximately 33 sites on which a final settlement has not been reached where the Company, along with others, has been designated a potentially responsible party by the Environmental Protection Agency or is otherwise engaged in investigation or remediation, including cleanup activity at certain of its current and former manufacturing sites. We do not expect that any sums we may have to pay in connection with these environmental matters would have a material adverse impact on our consolidated financial position. Additional information on the Company's environmental exposure is included under Narrative Description of the Company's Business Generally Environmental Controls.

In September 2010, the Brazilian Administrative Council for Economic Defense (CADE) issued a decision against our Brazilian subsidiary, Air Products Brasil Ltda., and several other Brazilian industrial gas companies for alleged anticompetitive activities. CADE imposed a civil fine of R\$179.2 million (approximately \$55 million at 30 September 2016) on Air Products Brasil Ltda. This fine was based on a recommendation by a unit of the Brazilian Ministry of Justice, whose investigation began in 2003, alleging violation of competition laws with respect to the sale of industrial and medical gases. The fines are based on a percentage of the Company's total revenue in Brazil in 2003.

We have denied the allegations made by the authorities and filed an appeal in October 2010 to the Brazilian courts. On 6 May 2014, our appeal was granted and the fine against Air Products Brasil Ltda. was dismissed. CADE has appealed that ruling and the matter remains pending. The Company, with advice of its outside legal counsel, has assessed the status of this matter and has concluded that, although an adverse final judgment after exhausting all appeals is possible, such a judgment is not probable. As a result, no provision has been made in the consolidated financial statements.

Other than this matter, we do not currently believe there are any legal proceedings, individually or in the aggregate, that are reasonably possible to have a material impact on our financial condition, results of operations, or cash flows. A future charge for regulatory fines or damage awards could have a significant impact on our net income in the period in which it is recorded.

**Table of Contents****ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS**

Not applicable

**PART II****ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES**

Our common stock (ticker symbol APD) is listed on the New York Stock Exchange. Our transfer agent and registrar is Broadridge Corporate Issuer Solutions, Inc., P.O. Box 1342, Brentwood, New York 11717, telephone (844) 318-0129 (U.S.) or (720) 358-3595 (all other locations); Internet website, <http://shareholder.broadridge.com/airproducts>; and e-mail address, [shareholder@broadridge.com](mailto:shareholder@broadridge.com). As of 31 October 2016, there were 5,974 record holders of our common stock. Quarterly stock prices, as reported on the New York Stock Exchange composite tape of transactions, and dividend information for the last two fiscal years appear below. Cash dividends on the Company's common stock are paid quarterly. It is our expectation that we will continue to pay cash dividends in the future at comparable or increased levels. The Board of Directors determines whether to declare dividends and the timing and amount based on financial condition and other factors it deems relevant.

**Quarterly Stock Information**

2016	High	Low	Close	Dividend
First	\$143.83	\$126.65	\$130.11	\$0.81
Second	147.16	114.64	144.05	0.86
Third	152.16	134.15	142.04	0.86
Fourth	157.84	137.31	150.34	0.86
				\$3.39
2015	High	Low	Close	Dividend
First	\$149.61	\$118.20	\$144.23	\$0.77
Second	158.20	137.07	151.28	0.81
Third	153.93	136.69	136.83	0.81
Fourth	148.56	123.66	127.58	0.81
				\$3.20

**Purchases of Equity Securities by the Issuer**

On 15 September 2011, the Board of Directors authorized the repurchase of up to \$1.0 billion of our outstanding common stock. This program does not have a stated expiration date. We repurchase shares pursuant to Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended, through repurchase agreements established with several brokers. There were no purchases of stock during fiscal year 2016. At 30 September 2016, \$485.3 million in share repurchase authorization remained. Additional purchases will be completed at the Company's discretion while maintaining sufficient funds for investing in its businesses and growth opportunities.



**Table of Contents**

**Performance Graph**

The performance graph below compares the five-year cumulative returns of the Company's common stock with those of the Standard & Poor's 500 Index (S&P 500 Index) and the Standard & Poor's 500 Materials Index (S&P 500 Materials Index). The figures assume an initial investment of \$100 and the reinvestment of all dividends.

COMPARISON OF FIVE YEAR CUMULATIVE SHAREHOLDER RETURN

Air Products, S&P 500 Index, and S&P 500 Materials Index

Comparative Growth of a \$100 Investment

(Assumes Reinvestment of All Dividends)

**Table of Contents****ITEM 6. SELECTED FINANCIAL DATA**

(Millions of dollars, except per share)	2016 <sup>(A)</sup>	2015 <sup>(A)</sup>	2014 <sup>(A)</sup>	2013 <sup>(A)</sup>	2012 <sup>(A)</sup>
<b>Operating Results</b>					
Sales	<b>\$9,524</b>	\$9,895	\$10,439	\$10,180	\$9,612
Cost of sales	<b>6,403</b>	6,939	7,630	7,470	7,052
Selling and administrative	<b>849</b>	939	1,055	1,063	947
Research and development	<b>132</b>	137	140	132	126
Business restructuring and cost reduction actions	<b>34</b>	208	13	232	327
Operating income	<b>2,106</b>	1,708	1,339	1,332	1,282
Equity affiliates income	<b>149</b>	155	151	168	154
Income from continuing operations attributable to Air Products	<b>1,515</b>	1,285	995	1,009	999
Net income attributable to Air Products	<b>631</b>	1,278	992	994	1,167
Basic earnings per common share attributable to Air Products:					
Income from continuing operations	<b>7.00</b>	5.98	4.68	4.81	4.73
Net income	<b>2.92</b>	5.95	4.66	4.74	5.53
Diluted earnings per common share attributable to Air Products:					
Income from continuing operations	<b>6.94</b>	5.91	4.62	4.75	4.66
Net income	<b>2.89</b>	5.88	4.61	4.68	5.44
<b>Year-End Financial Position</b>					
Plant and equipment, at cost	<b>\$20,190</b>	\$19,463	\$19,633	\$19,234	\$17,965
Total assets <sup>(H)</sup>	<b>18,055</b>	17,335	17,668	17,761	16,831
Working capital	<b>1,034</b>	(851)	199	100	605
Total debt <sup>(B)</sup>	<b>6,225</b>	5,879	6,119	6,274	5,292
Redeemable noncontrolling interest			287	376	393
Air Products shareholders equity	<b>7,080</b>	7,249	7,366	7,042	6,477
Total equity	<b>7,213</b>	7,381	7,521	7,199	6,623
<b>Financial Ratios</b>					
Return on average Air Products shareholders equity <sup>(C)</sup>	<b>21.2 %</b>	17.4 %	13.5 %	15.4 %	16.1 %
Operating margin	<b>22.1 %</b>	17.3 %	12.8 %	13.1 %	13.3 %
Selling and administrative as a percentage of sales	<b>8.9 %</b>	9.5 %	10.1 %	10.4 %	9.9 %
Total debt to total capitalization <sup>(B)(D)</sup>	<b>46.3 %</b>	44.3 %	43.9 %	45.3 %	43.0 %
<b>Other Data</b>					
Income from continuing operations including noncontrolling interests	<b>\$1,546</b>	\$1,324	\$996	\$1,048	\$1,025
Adjusted EBITDA <sup>(E)</sup>	<b>3,273</b>	2,984	2,776	2,648	2,528
Depreciation and amortization	<b>926</b>	936	957	907	841
Capital expenditures on a GAAP basis <sup>(F)</sup>	<b>1,056</b>	1,304	1,361	1,459	2,480
Capital expenditures on a non-GAAP basis <sup>(F)</sup>	<b>1,083</b>	1,678	1,564	1,708	2,698
Cash provided by operating activities	<b>2,707</b>	2,446	2,190	1,548	1,760
Cash used for investing activities	<b>972</b>	1,251	1,317	1,407	2,356

Edgar Filing: AIR PRODUCTS & CHEMICALS INC /DE/ - Form 10-K

Cash (used for) provided by financing activities	<b>(271)</b>	(945)	(504)	115	(78)
Dividends declared per common share	<b>3.39</b>	3.20	3.02	2.77	2.50
Weighted Average Common Shares Basic (in millions)	<b>216</b>	215	213	210	211
Weighted Average Common Shares Diluted (in millions)	<b>218</b>	217	215	212	215
Book value per common share at year-end	<b>\$32.57</b>	\$33.66	\$34.49	\$33.35	\$30.48
Shareholders at year-end	<b>6,000</b>	6,400	6,600	7,000	7,500
Employees at year-end <sup>(G)</sup>	<b>18,600</b>	19,700	21,200	21,600	21,300

---

**Table of Contents**

- (A) Unless otherwise stated, selected financial data is presented on a GAAP basis. Our operating results were impacted by certain items which management does not believe to be indicative of ongoing business trends and are excluded from the non-GAAP measure. Refer to pages 35-40 for a reconciliation of the GAAP to non-GAAP measures for 2016, 2015, and 2014. Descriptions of the excluded items appear on pages 27-29. For 2013, these items include: (i) a charge to operating income of \$232 (\$158 after-tax, or \$.74 per share) related to business restructuring and cost reduction actions, and (ii) expenses of \$10 (\$6 after-tax, or \$.03 per share) related to advisory costs. For 2012, these items include: (i) a charge to operating income of \$327 (\$222 after-tax, or \$1.03 per share) related to business restructuring and cost reduction actions, (ii) a gain of \$86 (\$55 after-tax, or \$.25 per share) related to the gain on our previously held equity interest in DA NanoMaterials, (iii) a charge of \$10 (\$6 after-tax, or \$.03 per share) related to a customer bankruptcy, (iv) a tax expense of \$44 (\$.20 per share) for a Spanish tax settlement, and (v) a tax benefit of \$58 (\$.27 per share) for a favorable Spanish tax ruling.
- (B) Total debt includes long-term debt, current portion of long-term debt, and short-term borrowings as of the end of the year.
- (C) Calculated using income from continuing operations attributable to Air Products and five-quarter average Air Products shareholders' equity.
- (D) Total capitalization includes total debt plus total equity plus redeemable noncontrolling interest as of the end of the year.
- (E) A reconciliation of reported GAAP results to Adjusted EBITDA is presented on pages 37-39.
- (F) Capital expenditures on a GAAP basis include additions to plant and equipment, investment in and advances to unconsolidated affiliates, and acquisitions. The Company utilizes a non-GAAP measure in the computation of capital expenditures and includes spending associated with facilities accounted for as capital leases and purchases of noncontrolling interests. Refer to page 42 for a reconciliation of the GAAP to non-GAAP measures for 2016, 2015, and 2014. For 2013, the GAAP measure was adjusted by \$235 and \$14 for spending associated with facilities accounted for as capital leases and purchases of noncontrolling interests, respectively. For 2012, the GAAP measure was adjusted by \$212 and \$6 for spending associated with facilities accounted for as capital leases and purchases noncontrolling interests, respectively.
- (G) Includes full- and part-time employees from continuing and discontinued operations.
- (H) Reflects adoption of guidance on the presentation of deferred income taxes on a retrospective basis. Refer to Note 2, New Accounting Guidance, for additional information.

**Table of Contents****ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS**

<u>Business Overview</u>	22
<u>2016 in Summary</u>	23
<u>2017 Outlook</u>	24
<u>Results of Operations</u>	25
<u>Reconciliation of Non-GAAP Financial Measures</u>	35
<u>Liquidity and Capital Resources</u>	41
<u>Contractual Obligations</u>	45
<u>Pension Benefits</u>	46
<u>Environmental Matters</u>	48
<u>Off-Balance Sheet Arrangements</u>	49
<u>Related Party Transactions</u>	49
<u>Inflation</u>	49
<u>Critical Accounting Policies and Estimates</u>	49
<u>New Accounting Guidance</u>	55
<u>Forward-Looking Statements</u>	55

The following discussion should be read in conjunction with the consolidated financial statements and the accompanying notes contained in this report. All comparisons in the discussion are to the corresponding prior year unless otherwise stated. All amounts presented are in accordance with U.S. generally accepted accounting principles (GAAP), except as noted. All amounts are presented in millions of dollars, except for share data, unless otherwise indicated.

Items such as income from continuing operations attributable to Air Products, net income attributable to Air Products, and diluted earnings per share attributable to Air Products (EPS) are simply referred to as income from continuing operations, net income, and diluted earnings per share throughout this Management's Discussion and Analysis, unless otherwise stated.

The discussion of results that follows includes comparisons to non-GAAP financial measures. The presentation of non-GAAP measures is intended to enhance the usefulness of financial information by providing measures which, when viewed together with our financial results reported in accordance with GAAP, provide a more complete understanding of the factors and trends affecting our historical financial performance and projected future results. The reconciliation of reported GAAP results to non-GAAP measures is presented on pages 35-40. Descriptions of the excluded items appear on pages 27-29.

**BUSINESS OVERVIEW**

Air Products and Chemicals, Inc. is a world-leading Industrial Gases company in operation for over 75 years. The Company's core Industrial Gases business provides atmospheric and process gases and related equipment to manufacturing markets, including refining and petrochemical, metals, electronics, and food and beverage. Air Products is also the world's leading supplier of liquefied natural gas process technology and equipment. The Company's Materials Technologies business serves the semiconductor, polyurethanes, cleaning and coatings, and adhesives industry.

With operations in over 50 countries, in 2016 we had sales of \$9.5 billion, assets of \$18.1 billion, and a worldwide workforce of approximately 18,600 employees.

As of 30 September 2016, our operations were organized into six reportable business segments: Industrial Gases-Americas, Industrial Gases- EMEA (Europe, Middle East, and Africa), Industrial Gases- Asia, Industrial Gases-Global, Materials Technologies, and Corporate and other. The financial statements and analysis that follow discuss our results based on these operations.

During the second quarter of fiscal year 2016, we committed to exit the Energy-from-Waste (EfW) business. The EfW segment is presented as a discontinued operation. Accordingly, prior year EfW business segment information has been reclassified to conform to current year presentation.

The Company's Materials Technologies business contains the Electronic Materials Division (EMD) and Performance Materials Division (PMD). We completed the spin-off of EMD as Versum Materials, Inc. on 1 October 2016. PMD is under a sales agreement subject to regulatory approval.

## **Table of Contents**

Refer to Note 26, Business Segment and Geographic Information, to the consolidated financial statements for additional details on our reportable business segments and Note 3, Materials Technologies Separation, for additional information on EMD and PMD.

## **2016 IN SUMMARY**

In 2016, we delivered strong results driven by cost improvement actions despite weakness in the worldwide economy and currency headwinds. We made significant progress on our strategy by focusing on our core industrial gases business and have significantly improved our profitability as measured by operating margin, adjusted operating margin, and adjusted EBITDA margin which all increased by at least 400 bp versus the prior year. During the year, we committed to exit our EfW business and completed the spin-off of our Electronic Materials division as a publicly traded company on 1 October 2016. We improved our focus on safety, delivered on our cost reduction targets, and increased accountability by aligning pay with performance. These changes drove increased profitability as we delivered operating margins of 22.1%, adjusted operating margins of 23.1%, and adjusted EBITDA margins of 34.4%. Also, EPS of \$6.94 increased 17% from the prior year. On a non-GAAP basis, EPS of \$7.55 increased 14%.

## **Highlights for 2016**

Sales of \$9,524.4 decreased 4%, or \$370.5. Underlying sales growth of 2% was more than offset by unfavorable currency and lower energy contractual cost pass-through to customers. Underlying sales increased from higher volumes in Industrial Gases Global and Industrial Gases Asia.

Operating income of \$2,106.0 increased 23%, or \$397.7, primarily due to better cost performance. On a non-GAAP basis, operating income of \$2,198.5 increased 16%, or \$305.3. Adjusted EBITDA of \$3,273.0 increased 10%, or \$288.9.

Income from continuing operations of \$1,515.3 increased 18%, or \$230.6, and diluted earnings per share from continuing operations of \$6.94 increased 17%, or \$1.03. On a non-GAAP basis, income from continuing operations of \$1,647.8 increased 15%, or \$214.0, and diluted earnings per share from continuing operations of \$7.55 increased 14%, or \$0.95. A summary table of changes in diluted earnings per share, including a non-GAAP reconciliation, is presented below.

We entered into a sales agreement to sell the Performance Materials division of our Materials Technologies segment to Evonik, which is subject to regulatory approval and other closing conditions.

We completed the spin-off of the Electronic Materials division as Versum Materials, Inc. on 1 October 2016.

We committed to exit the Energy-from-Waste business.

We increased our quarterly dividend by 6% from \$.81 to \$.86 per share. This represents the 34<sup>th</sup> consecutive year that we have increased our dividend payment.

For a discussion of the challenges, risks, and opportunities on which management is focused, refer to our 2017 Outlook below.



**Table of Contents****Changes in Diluted Earnings per Share Attributable to Air Products**

	2016	2015	Increase (Decrease)
<b>Diluted Earnings per Share</b>			
Net income	<b>\$2.89</b>	\$5.88	\$(2.99)
Loss from discontinued operations	<b>(4.05)</b>	(.03)	(4.02)
<b>Income from Continuing Operations GAAP Basis</b>	<b>\$6.94</b>	\$5.91	\$1.03
<b>Operating income (after-tax)</b>			
Underlying business			
Volume			(.01)
Price/raw materials			.29
Costs/other			.94
Currency			(.16)
Business separation costs			(.19)
Business restructuring and cost reduction actions			.60
Pension settlement loss			.04
Gain on previously held equity interest			(.05)
Gain on land sales			(.13)
<b>Operating Income</b>			1.33
<b>Other (after-tax)</b>			
Equity affiliates income			(.02)
Interest expense			(.04)
Loss on extinguishment of debt			.05
Income tax			(.06)
Tax costs related to business separation			(.24)
Noncontrolling interests			.04
Average shares outstanding			(.03)
<b>Other</b>			(.30)
<b>Total Change in Diluted Earnings per Share from Continuing Operations GAAP Basis</b>			\$1.03
	2016	2015	Increase (Decrease)
<b>Income from Continuing Operations GAAP Basis</b>	<b>\$6.94</b>	\$5.91	\$1.03
Business separation costs	<b>.22</b>	.03	.19
Tax costs related to business separation	<b>.24</b>		.24
Business restructuring and cost reduction actions	<b>.11</b>	.71	(.60)
Pension settlement loss	<b>.02</b>	.06	(.04)
Gain on previously held equity interest		(.05)	.05
Gain on land sales		(.13)	.13
Loss on extinguishment of debt	<b>.02</b>	.07	(.05)
<b>Income from Continuing Operations Non-GAAP Basis</b>	<b>\$7.55</b>	\$6.60	\$.95

## **2017 OUTLOOK**

For 2017, we intend to remain focused on key actions we can control to continue to drive earnings growth. We intend to accomplish this by bringing new industrial gas plant investments on-stream, making progress on the Jazan sale of equipment project, and continuing to deliver on cost reduction actions. We expect continued weakness in new LNG equipment orders primarily driven by low oil and natural gas prices.

**Table of Contents**

On 1 October 2016, we completed the separation of our Electronic Materials division through the spin-off of Versum Materials, Inc. We continue to make progress on the sale of our Performance Materials division and are targeting to close on the sale in fiscal year 2017. Fiscal 2017 earnings will be lower due to the separation of Electronic Materials. If we are able to close on the sale of Performance Materials and it becomes a discontinued operation in fiscal 2017, we expect earnings will be reduced further.

The above guidance should be read in conjunction with the section entitled Forward-Looking Statements.

**RESULTS OF OPERATIONS****Discussion of Consolidated Results**

	2016	2015	2014
Sales	<b>\$9,524.4</b>	\$9,894.9	\$10,439.0
Operating income GAAP Basis	<b>2,106.0</b>	1,708.3	1,339.1
Operating margin GAAP Basis	<b>22.1%</b>	17.3%	12.8%
Equity affiliates income	<b>148.6</b>	154.5	151.4
<b>Non-GAAP Basis</b>			
Adjusted EBITDA	<b>3,273.0</b>	2,984.1	2,775.7
Adjusted EBITDA margin	<b>34.4%</b>	30.2%	26.6%
Operating income	<b>2,198.5</b>	1,893.2	1,667.4
Operating margin	<b>23.1%</b>	19.1%	16.0%

**Sales**

	% Change from Prior Year	
	2016	2015
Underlying business		
Volume	2%	2%
Price	%	1%
Energy and raw material cost pass-through	(3)%	(3)%
Currency	(3)%	(5)%
<b>Total Consolidated Change</b>	<b>(4)%</b>	<b>(5)%</b>

**2016 vs. 2015**

Sales of \$9,524.4 decreased 4%, or \$370.5. Underlying sales increased 2% primarily due to higher volumes in Industrial Gases Global and Industrial Gases Asia, partially offset by lower volumes in all other segments. Price was flat as increases in the Industrial Gases Americas and Industrial Gases EMEA segments were offset by lower prices in Industrial Gases Asia. Underlying sales growth was more than offset by lower energy contractual cost pass-through to customers of 3% and unfavorable currency of 3%.

**2015 vs. 2014**

Sales of \$9,894.9 decreased 5%, or \$544.1. Underlying sales were up 3% from higher volumes of 2% and higher pricing of 1%. Volumes increased primarily from new plant on-streams in Industrial Gases Asia and base business growth in Materials Technologies. The favorable pricing was primarily driven by price increases in the Industrial Gases Americas and Materials Technologies segments. Currency unfavorably impacted sales by 5% and lower energy and raw material contractual cost pass-through to customers decreased sales by 3%.

## **Operating Income and Margin**

### **2016 vs. 2015**

On a GAAP basis, operating income of \$2,106.0 increased 23%, or \$397.7, as lower operating costs of \$271, lower business restructuring and cost reduction actions of \$174, favorable pricing, net of energy, fuel, and raw material costs, of \$84, and lower pension settlement losses of \$15, were partially offset by unfavorable currency impacts of \$46, higher business separation costs of \$45, and lower volumes of \$4. In addition, the prior year included a gain on land sales of \$34 and a gain of \$18 on a previously held equity interest. Operating costs decreased due to benefits from our cost reduction actions of \$132, lower pension expense of \$38, lower maintenance expense of \$34, and lower other costs of \$67.

## **Table of Contents**

Operating margin of 22.1% increased 480 bp, primarily due to favorable costs and favorable pricing, net of energy, fuel, and raw material costs.

On a non-GAAP basis, operating income of \$2,198.5 increased 16%, or \$305.3, and operating margin of 23.1% increased 400 bp.

### **2015 vs. 2014**

On a GAAP basis, operating income of \$1,708.3 increased 28%, or \$369.2, primarily from higher volumes of \$144, favorable pricing, net of energy and fuel costs, of \$105, and favorable cost performance across most segments of \$92, partially offset by unfavorable currency impacts of \$115. In addition, operating income in 2015 included a charge for business reorganization and cost reduction actions of \$208, a pension settlement loss of \$21, business separation costs of \$8, gains on land sales of \$34, and a gain of \$18 on revaluing a previously held equity interest upon purchase of our partner's shares. Operating income in 2014 included a goodwill and intangible asset charge of \$310, a business restructuring and cost reduction charge of \$13, and a pension settlement loss of \$6. The favorable operating costs of \$92 included benefits from our cost reduction actions of \$170 and lower maintenance expense of \$33, partially offset by higher incentive compensation of approximately \$100 due to improved results. Operating margin of 17.3% increased 450 bp.

On a non-GAAP basis, operating income of \$1,893.2 increased 14%, or \$225.8. The increase was primarily due to higher volumes of \$144, favorable pricing, net of energy and fuel costs, of \$105, and favorable cost performance across most segments of \$92, partially offset by unfavorable currency of \$115. Costs were lower as benefits from cost reduction actions of approximately \$170 and lower maintenance expense of \$33 were offset by higher incentive compensation of approximately \$100 due to improved results. Non-GAAP operating margin of 19.1% increased 310 bp due to favorable costs, higher volumes, and higher pricing.

### **Adjusted EBITDA**

We define Adjusted EBITDA as income from continuing operations (including noncontrolling interests) excluding certain disclosed items, which the Company does not believe to be indicative of underlying business trends, before interest expense, income tax provision, and depreciation and amortization expense. Adjusted EBITDA provides a useful metric for management to assess operating performance.

### **2016 vs. 2015**

Adjusted EBITDA of \$3,273.0 increased \$288.9, or 10%, primarily due to favorable costs and favorable pricing, net of energy, fuel, and raw material costs. Adjusted EBITDA margin of 34.4% increased 420 bp.

### **2015 vs. 2014**

Adjusted EBITDA of \$2,984.1 increased \$208.4, or 8%, due to higher volumes, higher pricing, and favorable costs. Adjusted EBITDA margin of 30.2% increased 360 bp.

### **Equity Affiliates Income**

### **2016 vs. 2015**

Income from equity affiliates of \$148.6 decreased \$5.9, as lower income from Industrial Gases Americas and Industrial Gases EMEA affiliates was partially offset by higher income from Industrial Gases Asia affiliates.

**2015 vs. 2014**

Income from equity affiliates of \$154.5 increased \$3.1, primarily due to higher volumes and favorable cost performance in our Industrial Gases Asia and Industrial Gases Americas affiliates.

**Cost of Sales and Gross Margin**

**2016 vs. 2015**

Cost of sales of \$6,402.7 decreased \$536.3, or 8%, primarily due to lower energy costs of \$271, lower operating costs of \$239, and a favorable currency impact of \$202, partially offset by higher costs attributable to sales volumes of \$176. Operating costs included favorable impacts from cost reduction actions of \$57, lower maintenance costs of \$34, lower pension expense of \$24, as well as the benefits of other operational improvements and productivity. Costs associated with volumes were higher primarily due to the Jazan sale of equipment activity.

Gross margin of 32.8% increased 290 bp, primarily due to lower costs.

## **Table of Contents**

### **2015 vs. 2014**

Cost of sales of \$6,939.0 decreased \$690.9, or 9%, primarily due to a favorable currency impact of \$368, lower energy costs of \$313, and lower operating costs of \$102, partially offset by costs attributable to higher sales volumes of \$92. Operating costs included favorable impacts from cost reduction actions of \$48 and lower other costs, including maintenance, of \$115, partially offset by higher incentive compensation of \$61.

Gross margin of 29.9% increased 300 bp, due to lower costs of 120 bp, higher price, net of raw materials, of 100 bp, and higher volumes of 80 bp.

### **Selling and Administrative Expense**

#### **2016 vs. 2015**

Selling and administrative expense of \$849.3 decreased \$90.0, or 10%, primarily due to the benefits of cost reduction actions of \$68 and favorable currency effects of \$28, partially offset by higher other costs of \$6. Selling and administrative expense as a percent of sales decreased to 8.9% from 9.5%.

#### **2015 vs. 2014**

Selling and administrative expense of \$939.3 decreased \$115.4, or 11%, primarily due to the benefits of cost reduction actions of \$122 and favorable currency effects of \$62, partially offset by higher other costs of \$69, driven by higher incentive compensation. Selling and administrative expense as a percent of sales decreased to 9.5% from 10.1%.

### **Research and Development**

#### **2016 vs. 2015**

Research and development expense of \$132.0 decreased \$5.1, or 4%. Fiscal year 2016 and 2015 research and development expense as a percent of sales was 1.4%.

#### **2015 vs. 2014**

Research and development expense of \$137.1 decreased \$2.7, or 2%. Fiscal year 2015 and 2014 research and development expense as a percent of sales was 1.4% and 1.3%, respectively.

### **Business Separation Costs**

On 16 September 2015, the Company announced plans to separate its Materials Technologies business, which contains two divisions, Electronic Materials (EMD) and Performance Materials (PMD), into an independent publicly traded company and distribute to Air Products shareholders all of the shares of the new public company in a tax free distribution (a spin-off). Versum Materials, LLC, or Versum, was formed as the new company to hold the Materials Technologies business subject to the spin-off. On 6 May 2016, the Company entered into an agreement to sell certain subsidiaries and assets comprising the PMD division to Evonik Industries AG for \$3.8 billion in cash and the assumption of certain liabilities. As a result, the Company moved forward with the planned spin-off of Versum containing only the EMD division.

On 1 October 2016, Air Products completed the separation of its EMD division through the spin-off of Versum. As a result, the historical results of EMD will be presented as a discontinued operation beginning in fiscal year 2017. We continue to evaluate the progress of the sale of the PMD division to determine when it should be presented as a discontinued operation.

In fiscal year 2016, we incurred separation costs of \$52.2 (\$48.3 after-tax, or \$.22 per share), primarily related to legal, advisory, and indirect tax costs associated with these transactions. The costs are reflected on the consolidated income statements as Business separation costs. A significant portion of these costs were not tax deductible because they were directly related to the plan for the tax-free spin-off of Versum. Our income tax provision includes additional tax expense related to the separation of \$51.8 (\$.24 per share), of which \$45.7 resulted from a dividend declared during the third quarter of 2016 to repatriate \$443.8 from a subsidiary in South Korea to the U.S. Previously, most of these foreign earnings were considered to be indefinitely reinvested.

We expect to incur additional legal and advisory fees in fiscal 2017.

On 30 September 2016, in anticipation of the spin-off, Versum entered into certain financing transactions to allow for a cash distribution of \$550.0 and a distribution in-kind of notes issued by Versum with an aggregate principal amount of \$425.0 to Air Products. Air Products then exchanged these notes with certain financial institutions for



## **Table of Contents**

\$418.3 of Air Products' outstanding commercial paper. The exchange resulted in a loss of \$6.9 (\$4.3 after-tax, or \$.02 per share) and has been reflected on the consolidated income statements as Loss on extinguishment of debt. This loss is deductible for tax purposes.

### **Business Restructuring and Cost Reduction Actions**

We recorded charges in 2016, 2015, and 2014 for business restructuring and cost reduction actions. The charges for these actions are excluded from segment operating income.

#### ***Cost Reduction Actions***

In fiscal year 2016, we recognized an expense of \$33.9 (\$24.0 after-tax, or \$.11 per share) for severance and other benefits related to cost reduction actions resulting from the elimination of approximately 700 positions. The expense related primarily to the Industrial Gases Americas and the Industrial Gases EMEA segments.

#### ***Business Realignment and Reorganization***

On 18 September 2014, we announced plans to reorganize the Company, including realignment of our businesses in new reporting segments and other organizational changes, effective as of 1 October 2014, which at the time resulted in the largest transformational change in the history of the Company. As a result of this reorganization, we incurred severance and other charges.

In fiscal year 2015, we recognized an expense of \$207.7 (\$153.2 after-tax, or \$.71 per share). Severance and other benefits totaled \$151.9 and related to the elimination of approximately 2,000 positions. Asset and associated contract actions totaled \$55.8 and related primarily to a plant shutdown in the Corporate and other segment and the exit of product lines within Industrial Gases Global and Materials Technologies segments.

During the fourth quarter of 2014, an expense of \$12.7 (\$8.2 after-tax, or \$.04 per share) was incurred relating to the elimination of approximately 50 positions.

Refer to Note 5, Business Restructuring and Cost Reduction Actions, to the consolidated financial statements for additional details on these actions.

### **Pension Settlement Loss**

Certain of our pension plans provide for a lump sum benefit payment option at the time of retirement, or for corporate officers, six months after the retirement date. Pension settlements are recognized when cash payments exceed the sum of the service and interest cost components of net periodic pension cost of the plan for the fiscal year. We recognized \$6.4 (\$4.1 after-tax, or \$.02 per share), \$21.2 (\$13.7 after-tax, or \$.06 per share), and \$5.5 (\$3.6 after-tax, or \$.02 per share) of settlement charges in 2016, 2015, and 2014, respectively. The settlement accelerated the recognition of a portion of actuarial losses deferred in accumulated other comprehensive loss primarily related to our U.S. Supplementary Pension Plan.

### **Goodwill and Intangible Asset Impairment Charge**

During the fourth quarter of 2014, we concluded that the goodwill and indefinite-lived intangible assets (primarily acquired trade names) associated with our Latin America reporting unit of our Industrial Gases Americas segment were impaired and recorded a noncash impairment charge of \$310.1 (\$275.1 attributable to Air Products after-tax, or

\$1.27 per share).

### **Gain on Previously Held Equity Interest**

On 30 December 2014, we acquired our partner's equity ownership interest in a liquefied atmospheric industrial gases production joint venture in North America for \$22.6 which increased our ownership from 50% to 100%. The transaction was accounted for as a business combination, and subsequent to the acquisition, the results are consolidated within our Industrial Gases - Americas segment. The assets acquired, primarily plant and equipment, were recorded at their fair value as of the acquisition date.

The acquisition date fair value of the previously held equity interest was determined using a discounted cash flow analysis under the income approach. During the first quarter of 2015, we recorded a gain of \$17.9 (\$11.2 after-tax, or \$.05 per share) as a result of revaluing our previously held equity interest to fair value as of the acquisition date.

**Table of Contents****Other Income (Expense), Net**

Items recorded to other income (expense), net arise from transactions and events not directly related to our principal income earning activities. The detail of other income (expense), net is presented in Note 24, Supplemental Information, to the consolidated financial statements.

**2016 vs. 2015**

Other income (expense), net of \$58.1 increased \$10.8 primarily due to lower foreign exchange losses, favorable contract settlements, and receipt of a government subsidy. The prior year included a gain of \$33.6 (\$28.3 after-tax, or \$.13 per share) resulting from the sale of two parcels of land. No other individual items were significant in comparison to the prior year.

**2015 vs. 2014**

Other income (expense), net of \$47.3 decreased \$5.5 and included a gain of \$33.6 (\$28.3 after-tax, or \$.13 per share) resulting from the sale of two parcels of land. The gain was partially offset by unfavorable foreign exchange impacts and lower gains on other sales of assets and emissions credits. No other individual items were significant in comparison to fiscal year 2014.

**Interest Expense**

	<b>2016</b>	2015	2014
Interest incurred	<b>\$148.4</b>	\$152.6	\$158.1
Less: Capitalized interest	<b>32.9</b>	49.1	33.0
<b>Interest Expense</b>	<b>\$115.5</b>	\$103.5	\$125.1

**2016 vs. 2015**

Interest incurred decreased \$4.2. The decrease primarily resulted from a stronger U.S. dollar on the translation of foreign currency interest of \$6, partially offset by a higher average debt balance of \$2. The change in capitalized interest was driven by a decrease in the carrying value of projects under construction, primarily as a result of our exit from the Energy-from-Waste business.

**2015 vs. 2014**

Interest incurred decreased \$5.5. The decrease was driven by the impact of a stronger U.S. dollar on the translation of foreign currency interest of \$12, partially offset by a higher average debt balance of \$7. The change in capitalized interest was driven by a higher carrying value in construction in progress.

**Loss on Extinguishment of Debt**

On 30 September 2016, in anticipation of the Versum spin-off, Versum issued \$425.0 of notes to Air Products, who then exchanged these notes with certain financial institutions for \$418.3 of Air Products' outstanding commercial paper. The exchange resulted in a loss of \$6.9 (\$4.3 after-tax, or \$.02 per share).

In September 2015, we made a payment of \$146.6 to redeem 3,000,000 Unidades de Fomento ( UF ) Series E 6.30% Bonds due 22 January 2030 that had a carrying value of \$130.0 and resulted in a net loss of \$16.6 (\$14.2 after-tax, or \$.07 per share).

## **Effective Tax Rate**

The effective tax rate equals the income tax provision divided by income from continuing operations before taxes. Refer to Note 23, Income Taxes, to the consolidated financial statements for details on factors affecting the effective tax rate.

### **2016 vs. 2015**

On a GAAP basis, the effective tax rate was 27.5% and 24.0% in 2016 and 2015, respectively. The change included a 240 bp impact from tax costs associated with business separation, primarily resulting from a dividend declared in 2016 to repatriate cash from a foreign subsidiary, as discussed above in Business Separation Costs. The remaining 110 bp change was primarily due to the increase in mix of income in jurisdictions with a higher effective tax rate and the impact of business separation costs for which a tax benefit was not available. On a non-GAAP basis, the effective tax rate increased from 24.2% in 2015 to 24.8% in 2016, primarily due to the increase in and mix of income in jurisdictions with a higher effective tax rate.

**Table of Contents****2015 vs. 2014**

On a GAAP basis, the effective tax rate was 24.0% and 27.1% in 2015 and 2014, respectively. The effective tax rate was higher in fiscal year 2014 primarily due to the goodwill impairment charge of \$305.2, which was not deductible for tax purposes, and the Chilean tax reform enacted in September 2014 which increased income tax expense by \$20.6. These impacts were partially offset by an income tax benefit of \$51.6 associated with losses from transactions and a tax election in a non-U.S. subsidiary. Refer to Note 10, Goodwill, and Note 23, Income Taxes, to the consolidated financial statements for additional information. On a non-GAAP basis, the effective tax rate was 24.2% and 24.1% in 2015 and 2014, respectively.

**Discontinued Operations**

On 29 March 2016, the Board of Directors approved the Company's exit of its Energy-from-Waste (EfW) business. As a result, efforts to start up and operate its two EfW projects located in Tees Valley, United Kingdom, have been discontinued. The decision to exit the business and stop development of the projects was based on continued difficulties encountered and the Company's conclusion, based on testing and analysis completed during the second quarter of fiscal year 2016, that significant additional time and resources would be required to make the projects operational. In addition, the decision allows the Company to execute its strategy of focusing resources on its core Industrial Gases business. The EfW segment has been presented as a discontinued operation. Prior year EfW business segment information has been reclassified to conform to current year presentation.

In fiscal 2016, our loss from discontinued operations, net of tax, of \$884.2 primarily resulted from the write down of assets to their estimated net realizable value and to record a liability for plant disposition and other costs. Income tax benefits related only to one of the projects, as the other did not qualify for a local tax deduction. The loss from discontinued operations also includes land lease costs, commercial and administrative costs, and costs incurred for ongoing project exit activities.

We expect additional exit costs of \$50 to \$100 to be recorded in future periods.

In fiscal 2015, our loss from discontinued operations, net of tax, related to EfW was \$6.8. This resulted from costs for land leases and commercial and administrative expenses.

In fiscal 2014, our loss from discontinued operations, net of tax, was \$2.9. This included a loss, net of tax, of \$7.5 for the cost of EfW land leases and commercial and administrative expenses. This loss was partially offset by a gain of \$3.9 for the sale of the remaining Homecare business and settlement of contingencies related to a sale of a separate portion of the business to The Linde Group in 2012.

Refer to Note 4, Discontinued Operations, for additional details.

**Segment Analysis****Industrial Gases Americas**

	2016	2015	2014
Sales	<b>\$3,343.6</b>	\$3,693.9	\$4,078.5
Operating income	<b>895.2</b>	808.4	762.6
Operating margin	<b>26.8 %</b>	21.9 %	18.7 %
Equity affiliates' income	<b>52.7</b>	64.6	60.9

Adjusted EBITDA	<b>1,390.4</b>	1,289.9	1,237.9
Adjusted EBITDA margin	<b>41.6 %</b>	34.9 %	30.4 %

**Table of Contents****Industrial Gases Americas Sales**

	% Change from Prior Year	
	2016	2015
Underlying business		
Volume	(2)%	%
Price	1%	2%
Energy and raw material cost pass-through	(6)%	(8)%
Currency	(2)%	(3)%
<b>Total Industrial Gases Americas Change</b>	<b>(9)%</b>	<b>(9)%</b>
<b>2016 vs. 2015</b>		

Underlying sales decreased 1% from lower volumes of 2%, partially offset by higher pricing of 1%. Volumes were down due to weakness in Latin America and lower steel demand in North America. Pricing was higher due to the benefit of pricing actions, mainly the recovery of inflationary and power cost increases in Latin America. Lower energy contractual cost pass-through to customers, primarily natural gas, decreased sales by 6%. Currency decreased sales by 2% primarily due to the impacts of the Chilean Peso, Brazilian Real, and Canadian Dollar.

Operating income of \$895.2 increased 11%, or \$86.8, due to lower operating costs of \$108 and higher pricing, net of energy and fuel costs, of \$26, partially offset by lower volumes of \$33 and unfavorable currency impacts of \$14. Operating costs were lower due to benefits from cost reduction actions. Operating margin increased 490 bp from the prior year, primarily due to the lower costs, with additional benefits from lower energy pass-through and higher pricing.

Equity affiliates income of \$52.7 decreased \$11.9 primarily due to unfavorable currency impacts and higher maintenance expense.

**2015 vs. 2014**

Underlying sales increased 2% from higher pricing. Volumes were flat as growth in liquid oxygen and nitrogen and gaseous hydrogen were offset by lower helium and gaseous oxygen demand. Pricing was higher due to strength in helium and price increases to recover higher costs. Currency decreased sales by 3% primarily due to the impacts of the Chilean Peso, Brazilian Real, and Canadian Dollar. Lower energy contractual cost pass-through to customers, primarily natural gas, decreased sales by 8%.

Operating income of \$808.4 increased 6%, or \$45.8, due to higher pricing net of energy and fuel costs of \$65 and favorable volume mix impacts of \$6, partially offset by unfavorable currency impacts of \$21 and higher costs of \$4 mainly due to higher incentive compensation mostly offset by the benefits of our recent restructuring actions. Operating margin increased 320 bp from the prior year, primarily due to the higher pricing and lower energy contractual cost pass-through to customers.

Equity affiliates income of \$64.6 increased \$3.7 due to improved performance in our Mexican equity affiliate.

**Industrial Gases EMEA**

2016	2015	2014
------	------	------

Edgar Filing: AIR PRODUCTS & CHEMICALS INC /DE/ - Form 10-K

Sales	<b>\$1,700.3</b>	\$1,864.9	\$2,150.7
Operating income	<b>382.8</b>	330.7	351.2
Operating margin	<b>22.5 %</b>	17.7 %	16.3 %
Equity affiliates income	<b>36.5</b>	42.4	44.1
Adjusted EBITDA	<b>605.0</b>	567.4	615.5
Adjusted EBITDA margin	<b>35.6 %</b>	30.4 %	28.6 %



**Table of Contents****Industrial Gases EMEA Sales**

	% Change from Prior Year	
	2016	2015
Underlying business		
Volume	(2)%	%
Price	1%	1%
Energy and raw material cost pass-through	(4)%	(1)%
Currency	(4)%	(13)%
<b>Total Industrial Gases EMEA Change</b>	<b>(9)%</b>	<b>(13)%</b>
<b>2016 vs. 2015</b>		

Underlying sales decreased 1% as lower volumes of 2% were partially offset by higher pricing of 1%. Volumes decreased primarily due to continued weakness in the European economy. Lower energy and natural gas contractual cost pass-through to customers decreased sales by 4%. Unfavorable currency effects from the Euro and the British Pound Sterling reduced sales by 4%. Other than the impact on currency, the Brexit vote did not have a notable impact on our business.

Operating income of \$382.8 increased 16%, or \$52.1, primarily due to favorable operating costs of \$59 and higher pricing, net of energy and fuel costs, of \$20, partially offset by unfavorable currency impacts of \$18 and lower volumes of \$9. Operating margin increased 480 bp from the prior year primarily due to favorable cost performance, higher pricing, and lower energy pass-through.

Equity affiliates income of \$36.5 decreased \$5.9 primarily due to unfavorable currency impacts.

As a result of our exit from the Energy-from-Waste segment, the Company is evaluating the disposition of an air separation unit in the Industrial Gases EMEA segment that was constructed primarily to provide oxygen to one of the Tees Valley plants. The current value of this asset is approximately £40 million (\$52 million).

**2015 vs. 2014**

Underlying sales increased 1% from pricing improvement in both packaged gas and liquid bulk. Volumes were flat as higher liquid oxygen and nitrogen volumes were offset by lower cylinder and helium volumes. Unfavorable currency effects, primarily from the Euro, the British Pound Sterling, and the Polish Zloty, reduced sales by 13%. Lower energy contractual cost pass-through to customers decreased sales by 1%.

Operating income of \$330.7 decreased 6%, or \$20.5, due to unfavorable currency impacts of \$44, partially offset by lower costs of \$13 resulting from restructuring actions, favorable volume mix impacts of \$5, and higher pricing, net of energy and fuel costs, of \$5. Operating margin increased 140 bp from 2014 primarily due to the lower costs.

Equity affiliates income of \$42.4 decreased \$1.7.

**Industrial Gases Asia**

	2016	2015	2014
Sales	\$1,716.1	\$1,637.5	\$1,527.0
Operating income	449.1	380.5	310.4
Operating margin	26.2 %	23.2 %	20.3 %
Equity affiliates income	57.8	46.1	38.0

Adjusted EBITDA	<b>704.0</b>	629.5	553.7
Adjusted EBITDA margin	<b>41.0 %</b>	38.4 %	36.3 %

**Industrial Gases Asia Sales**

	% Change from Prior Year	
	2016	2015
Underlying business		
Volume	<b>11%</b>	12%
Price	<b>(1)%</b>	(2)%
Energy and raw material cost pass-through	<b>%</b>	1%
Currency	<b>(5)%</b>	(4)%
<b>Total Industrial Gases Asia Change</b>	<b>5%</b>	7%

**Table of Contents****2016 vs. 2015**

Underlying sales increased by 10% from higher volumes of 11%, partially offset by lower pricing of 1%. Volumes were higher primarily from new plants in China and higher merchant volumes across Asia. Pricing was down due to continued pricing pressure on merchant products in China and helium oversupply into Asia. Unfavorable currency impacts, primarily from the Chinese Renminbi, Korean Won, and Taiwanese Dollar decreased sales by 5%.

Operating income of \$449.1 increased 18%, or \$68.6, primarily due to higher volumes of \$66 and lower operating costs of \$34, partially offset by an unfavorable currency impact of \$19 and unfavorable pricing, net of energy and fuel costs, of \$12. The lower operating costs were driven by our operational improvements. Operating margin increased 300 bp, due to favorable cost performance and higher volumes.

Equity affiliates income of \$57.8 increased \$11.7 primarily due to favorable contract and insurance settlements, higher volumes, and improved cost performance.

**2015 vs. 2014**

Underlying sales increased by 10% from higher volumes of 12%, partially offset by lower pricing of 2%. Volumes were higher primarily from new plants, and in particular, a large on-site project in China. Pricing was down due to continued pricing pressure on merchant products in China. Unfavorable currency impacts decreased sales by 4%. Higher energy contractual cost-pass through to customers increased sales by 1%.

Operating income of \$380.5 increased 23%, or \$70.1, primarily due to higher volumes of \$76 and lower costs of \$42 resulting from restructuring and underlying productivity, partially offset by lower pricing, net of energy and fuel costs, of \$35 and an unfavorable currency impact of \$13. Operating margin increased 290 bp, primarily due to favorable cost performance and higher volumes, partially offset by lower pricing.

Equity affiliates income of \$46.1 increased \$8.1 primarily due to higher volumes and favorable cost performance.

**Industrial Gases Global**

	<b>2016</b>	2015	2014
Sales	<b>\$498.8</b>	\$286.8	\$296.0
Operating loss	<b>(21.3)</b>	(51.6)	(57.3)
Adjusted EBITDA	<b>(13.5)</b>	(35.9)	(44.4)

The Industrial Gases Global segment includes sales of cryogenic and gas processing equipment for air separation and centralized global costs associated with management of all the Industrial Gases segments.

**2016 vs. 2015**

Sales of \$498.8 increased \$212.0, or 74%. The increase in sales was driven by a sale of equipment contract for multiple air separation units that will serve Saudi Aramco's Jazan oil refinery and power plant in Saudi Arabia which more than offset the decrease in small equipment and other air separation unit sales. In 2016, we recognized approximately \$300 of sales related to the Jazan project.

Operating loss of \$21.3 decreased 59%, or \$30.3, primarily from income on the Jazan project and benefits from the cost reduction actions, partially offset by lower other sale of equipment project activity and a gain associated with the cancellation of a sale of equipment contract that was recorded in the prior year.

**2015 vs. 2014**

Sales of \$286.8 decreased \$9.2, or 3%, due to unfavorable currency impacts. Operating loss of \$51.6 decreased 10%, or \$5.7, primarily due to benefits of cost reduction actions and a gain associated with the cancellation of a sale of equipment contract, partially offset by less profitable business mix, unfavorable project costs, and bad debt expense.

**Materials Technologies**

	<b>2016</b>	2015	2014
Sales	<b>\$2,019.5</b>	\$2,087.1	\$2,064.6
Operating income	<b>530.2</b>	476.7	379.0
Operating margin	<b>26.3 %</b>	22.8 %	18.4 %
Adjusted EBITDA	<b>609.3</b>	571.7	480.7
Adjusted EBITDA margin	<b>30.2 %</b>	27.4 %	23.3 %

**Table of Contents****Materials Technologies Sales**

	% Change from Prior Year	
	2016	2015
Underlying business		
Volume	(2)%	3%
Price	%	2%
Currency	(1)%	(4)%
<b>Total Materials Technologies Change</b>	<b>(3)%</b>	<b>1%</b>

**2016 vs. 2015**

Underlying sales decreased by 2% from lower volumes. Electronic Materials underlying sales decreased 2% primarily from lower delivery systems volumes, partially offset by higher pricing. Performance Materials underlying sales decreased 2% primarily due to lower price, which was down due to lower raw material costs, partially offset by higher volumes. Unfavorable currency impacts decreased sales by 1%.

Operating income of \$530.2 increased 11%, or \$53.5, as higher pricing, net of raw material costs, of \$51 and lower costs of \$15 were partially offset by unfavorable currency impacts of \$11. The lower costs include the benefits of business restructuring and cost reduction actions.

Operating margin increased 350 bp, primarily from favorable pricing, net of raw material costs, and improved cost performance.

**2015 vs. 2014**

Underlying sales increased by 5% from higher volumes of 3% and positive pricing of 2%. Unfavorable currency impacts decreased sales by 4%. Electronic Materials underlying sales increased 10% from positive volume and price from new products and memory market demand, partially offset by lower delivery systems activity. Performance Materials underlying sales were flat as higher volumes of 1% were offset by lower pricing of 1%.

Operating income of \$476.7 increased 26%, or \$97.7, due to favorable price and mix, net of raw material costs, of \$70, higher volumes of \$40, and lower costs of \$13, partially offset by unfavorable currency impacts of \$25. The cost improvement came primarily from optimization of production and supply chain networks and benefits of cost reduction actions. Operating margin increased 440 bp, from higher pricing, higher volumes, and lower operating costs.

**Corporate and other**

	2016	2015	2014
Sales	<b>\$246.1</b>	\$324.7	\$322.2
Operating loss	<b>(37.5)</b>	(51.5)	(78.5)
Adjusted EBITDA	<b>(22.2)</b>	(38.5)	(67.7)

The Corporate and other segment consists of our liquefied natural gas (LNG) and helium container businesses, as well as corporate costs which are not business-specific.

**2016 vs. 2015**

Sales of \$246.1 decreased \$78.6, or 24%, primarily due to lower LNG sale of equipment activity.

Operating loss of \$37.5 decreased 27%, or \$14.0, due to benefits from our recent cost reduction actions and lower foreign exchange losses, partially offset by lower LNG activity.

**2015 vs. 2014**

Sales of \$324.7 increased \$2.5, or 1%, primarily due to higher LNG project activity, mostly offset by lower helium container sales and the impact of exiting our PUI business which was completed as of the end of the first quarter of 2014. Operating loss of \$51.5 decreased 34%, or \$27.0, primarily due to higher LNG project activity and the benefits of our cost reduction actions.

**Table of Contents**

**RECONCILIATION OF NON-GAAP FINANCIAL MEASURES**

(Millions of dollars unless otherwise indicated, except for share data)

The Company has presented certain financial measures on a non-GAAP ( adjusted ) basis and has provided a reconciliation to the most directly comparable financial measure calculated in accordance with GAAP. These financial measures are not meant to be considered in isolation or as a substitute for the most directly comparable financial measure calculated in accordance with GAAP. The Company believes these non-GAAP measures provide investors, potential investors, securities analysts, and others with useful information to evaluate the performance of the business because such measures, when viewed together with our financial results computed in accordance with GAAP, provide a more complete understanding of the factors and trends affecting our historical financial performance and projected future results.

In many cases, our non-GAAP measures are determined by adjusting the most directly comparable GAAP financial measure to exclude certain disclosed items ( non-GAAP adjustments ) that we believe are not representative of the underlying business performance. For example, Air Products is currently executing its strategic plan to restructure the Company and to focus on the Company's core Industrial Gases businesses, which has and will continue to result in significant disclosed items that we believe are important for investors to understand separately from the performance of the underlying business. The tax impact of our non-GAAP adjustments reflects the expected current and deferred income tax expense impact of the transactions and is impacted primarily by the statutory tax rate of the various relevant jurisdictions and the taxability of the adjustments in those jurisdictions. In evaluating these financial measures, the reader should be aware that we may incur expenses similar to those eliminated in this presentation in the future. Investors should also consider the limitations associated with these non-GAAP measures, including the potential lack of comparability of these measures from one company to another.

Presented below are reconciliations of the reported GAAP results to the non-GAAP measures:

**Table of Contents****CONSOLIDATED RESULTS**

	Continuing Operations				
	Operating Income	Operating Margin <sup>(A)</sup>	Income Tax Provision <sup>(B)</sup>	Net Income	Diluted EPS
<b>2016 GAAP</b>	<b>\$2,106.0</b>	<b>22.1%</b>	<b>\$586.5</b>	<b>\$1,515.3</b>	<b>\$6.94</b>
<b>2015 GAAP</b>	<b>1,708.3</b>	<b>17.3%</b>	<b>418.3</b>	<b>1,284.7</b>	<b>5.91</b>
Change GAAP	\$397.7	480bp	\$168.2	\$230.6	\$1.03
% Change GAAP	23%		40%	18%	17%
2016 GAAP	\$2,106.0	22.1%	\$586.5	\$1,515.3	\$6.94
Business separation costs <sup>(C)</sup>	52.2	.5%	3.9	48.3	.22
Tax costs associated with business separation <sup>(C)</sup>			(51.8)	51.8	.24
Business restructuring and cost reduction actions	33.9	.4%	9.9	24.0	.11
Pension settlement loss	6.4	.1%	2.3	4.1	.02
Loss on extinguishment of debt <sup>(D)</sup>			2.6	4.3	.02
<b>2016 Non-GAAP Measure</b>	<b>\$2,198.5</b>	<b>23.1%</b>	<b>\$553.4</b>	<b>\$1,647.8</b>	<b>\$7.55</b>
2015 GAAP	\$1,708.3	17.3%	\$418.3	\$1,284.7	\$5.91
Business separation costs <sup>(C)</sup>	7.5	.1%		7.5	.03
Business restructuring and cost reduction actions	207.7	2.1%	54.5	153.2	.71
Pension settlement loss	21.2	.2%	7.5	13.7	.06
Gain on previously held equity interest	(17.9)	(.2)%	(6.7)	(11.2)	(.05)
Gain on land sales <sup>(E)</sup>	(33.6)	(.4)%	(5.3)	(28.3)	(.13)
Loss on extinguishment of debt <sup>(D)</sup>			2.4	14.2	.07
<b>2015 Non-GAAP Measure</b>	<b>\$1,893.2</b>	<b>19.1%</b>	<b>\$470.7</b>	<b>\$1,433.8</b>	<b>\$6.60</b>
Change Non-GAAP Measure	\$305.3	400bp	\$82.7	\$214.0	\$0.95
% Change Non-GAAP Measure	16%		18%	15%	14%

	Continuing Operations				
	Operating Income	Operating Margin <sup>(A)</sup>	Income Tax Provision <sup>(B)</sup>	Net Income	Diluted EPS
<b>2015 GAAP</b>	<b>\$1,708.3</b>	<b>17.3%</b>	<b>\$418.3</b>	<b>\$1,284.7</b>	<b>\$5.91</b>
<b>2014 GAAP</b>	<b>1,339.1</b>	<b>12.8%</b>	<b>369.4</b>	<b>994.6</b>	<b>4.62</b>
Change GAAP	\$369.2	450bp	\$48.9	\$290.1	\$1.29
% Change GAAP	28%		13%	29%	28%
2015 GAAP	\$1,708.3	17.3%	\$418.3	\$1,284.7	\$5.91
Business separation costs <sup>(C)</sup>	7.5	.1%		7.5	.03
Business restructuring and cost reduction actions	207.7	2.1%	54.5	153.2	.71
Pension settlement loss	21.2	.2%	7.5	13.7	.06
Gain on previously held equity interest	(17.9)	(.2)%	(6.7)	(11.2)	(.05)
Gain on land sales <sup>(E)</sup>	(33.6)	(.4)%	(5.3)	(28.3)	(.13)



Edgar Filing: AIR PRODUCTS & CHEMICALS INC /DE/ - Form 10-K

Loss on extinguishment of debt <sup>(D)</sup>			2.4	14.2	.07
<b>2015 Non-GAAP Measure</b>	<b>\$1,893.2</b>	<b>19.1%</b>	<b>\$470.7</b>	<b>\$1,433.8</b>	<b>\$6.60</b>
2014 GAAP	\$1,339.1	12.8%	\$369.4	\$994.6	\$4.62
Business restructuring and cost reduction actions	12.7	.1%	4.5	8.2	.04
Pension settlement loss	5.5	.1%	1.9	3.6	.02
Goodwill and intangible asset impairment charge <sup>(F)</sup>	310.1	3.0%	1.3	275.1	1.27
Chilean tax rate change			(20.6)	20.6	.10
Tax election benefit			51.6	(51.6)	(.24)
<b>2014 Non-GAAP Measure</b>	<b>\$1,667.4</b>	<b>16.0%</b>	<b>\$408.1</b>	<b>\$1,250.5</b>	<b>\$5.81</b>
Change Non-GAAP Measure	\$225.8	310bp	\$62.6	\$183.3	\$.79
% Change Non-GAAP Measure	14%		15%	15%	14%

(A) Operating margin is calculated by dividing operating income by sales.

**Table of Contents**

- (B) The tax impact of our non-GAAP adjustments reflects the expected current and deferred income tax expense impact of the transactions and is impacted primarily by the statutory tax rate of the various relevant jurisdictions and the taxability of the adjustments in those jurisdictions.
- (C) Refer to Note 3, Materials Technologies Separation, to the consolidated financial statements for additional information.
- (D) Income from continuing operations before taxes impact of \$6.9 and \$16.6 in 2016 and 2015, respectively.
- (E) Reflected on the consolidated income statements in Other income (expense), net.
- (F) Net income attributable to noncontrolling interests impact of \$33.7.

**ADJUSTED EBITDA**

We define Adjusted EBITDA as income from continuing operations (including noncontrolling interests) excluding certain disclosed items, which the Company does not believe to be indicative of underlying business trends, before interest expense, income tax provision, and depreciation and amortization expense. Adjusted EBITDA provides a useful metric for management to assess operating performance.

Below is a reconciliation of Income from Continuing Operations on a GAAP basis to Adjusted EBITDA:

	2016	2015	2014	2013	2012
<b>Income from Continuing Operations<sup>(A)</sup></b>	<b>\$1,545.7</b>	\$1,324.4	\$996.0	\$1,047.6	\$1,025.2
Add: Interest expense	115.5	103.5	125.1	141.8	123.7
Add: Income tax provision	586.5	418.3	369.4	310.2	287.3
Add: Depreciation and amortization	925.9	936.4	956.9	907.0	840.8
Add: Business separation costs	52.2	7.5			
Add: Business restructuring and cost reduction actions	33.9	207.7	12.7	231.6	327.4
Add: Pension settlement loss	6.4	21.2	5.5		
Add: Goodwill and intangible asset impairment charge			310.1		
Less: Gain on previously held equity interest		17.9			85.9
Add: Advisory costs				10.1	
Add: Customer bankruptcy					9.8
Less: Gain on land sales <sup>(B)</sup>		33.6			
Add: Loss on early retirement of debt	6.9	16.6			
<b>Adjusted EBITDA</b>	<b>\$3,273.0</b>	\$2,984.1	\$2,775.7	\$2,648.3	\$2,528.3
<b>Change GAAP</b>					
Income from continuing operations change	\$221.3	\$328.4	\$(51.6)	\$22.4	
Income from continuing operations % change	17%	33%	(5)%	2%	
<b>Change Non-GAAP</b>					
Adjusted EBITDA change	\$288.9	\$208.4	\$127.4	\$120.0	
Adjusted EBITDA % change	10%	8%	5%	5%	

(A) Includes net income attributable to noncontrolling interests.

(B) Reflected on the consolidated income statements in Other income (expense), net.



**Table of Contents**

Below is a summary of segment operating income:

	Industrial Gases Americas	Industrial Gases EMEA	Industrial Gases Asia	Industrial Gases Global	Materials Technologies	Corporate and other	Segment Total
<b>GAAP Measure</b>							
<b>Twelve Months Ended 30 September 2016</b>							
Operating income (loss)	\$895.2	\$382.8	\$449.1	\$(21.3)	\$530.2	\$(37.5)	\$2,198.5
Operating margin	26.8%	22.5%	26.2%		26.3%		23.1%
<b>Twelve Months Ended 30 September 2015</b>							
Operating income (loss)	\$808.4	\$330.7	\$380.5	\$(51.6)	\$476.7	\$(51.5)	\$1,893.2
Operating margin	21.9%	17.7%	23.2%		22.8%		19.1%
<b>Twelve Months Ended 30 September 2014</b>							
Operating income (loss)	\$762.6	\$351.2	\$310.4	\$(57.3)	\$379.0	\$(78.5)	\$1,667.4
Operating margin	18.7%	16.3%	20.3%		18.4%		16.0%
<b>2016 vs. 2015</b>							
Operating income (loss) change	\$86.8	\$52.1	\$68.6	\$30.3	\$53.5	\$14.0	\$305.3
Operating income (loss) % change	11%	16%	18%	59%	11%	27%	16%
Operating margin change	490bp	480bp	300bp		350bp		400bp
<b>2015 vs. 2014</b>							
	\$45.8	\$(20.5)	\$70.1	\$5.7	\$97.7	\$27.0	\$225.8

Operating income (loss) change							
Operating income (loss) % change	6%	(6)%	23%	10%	26%	34%	14%
Operating margin change	320bp	140bp	290bp		440bp		310bp

**Table of Contents**

Below is a reconciliation of segment operating income to adjusted EBITDA:

	Industrial Gases Americas	Industrial Gases EMEA	Industrial Gases Asia	Industrial Gases Global	Materials Technologies	Corporate and other	Segment Total
<b>Non-GAAP Measure</b>							
<b>Twelve Months Ended</b>							
<b>30 September 2016</b>							
Operating income (loss)	\$895.2	\$382.8	\$449.1	\$(21.3)	\$530.2	\$(37.5)	\$2,198.5
Add: Depreciation and amortization	442.5	185.7	197.1	7.9	77.4	15.3	925.9
Add: Equity affiliates income (loss)	52.7	36.5	57.8	(.1)	1.7		148.6
<b>Adjusted EBITDA</b>	<b>\$1,390.4</b>	<b>\$605.0</b>	<b>\$704.0</b>	<b>\$(13.5)</b>	<b>\$609.3</b>	<b>\$(22.2)</b>	<b>\$3,273.0</b>
<b>Adjusted EBITDA margin<sup>(A)</sup></b>	<b>41.6%</b>	<b>35.6%</b>	<b>41.0%</b>		<b>30.2%</b>		<b>34.4%</b>
<b>Twelve Months Ended</b>							
<b>30 September 2015</b>							
Operating income (loss)	\$808.4	\$330.7	\$380.5	\$(51.6)	\$476.7	\$(51.5)	\$1,893.2
Add: Depreciation and amortization	416.9	194.3	202.9	16.5	92.8	13.0	936.4
Add: Equity affiliates income	64.6	42.4	46.1	(.8)	2.2		154.5
<b>Adjusted EBITDA</b>	<b>\$1,289.9</b>	<b>\$567.4</b>	<b>\$629.5</b>	<b>\$(35.9)</b>	<b>\$571.7</b>	<b>\$(38.5)</b>	<b>\$2,984.1</b>
<b>Adjusted EBITDA margin<sup>(A)</sup></b>	<b>34.9%</b>	<b>30.4%</b>	<b>38.4%</b>		<b>27.4%</b>		<b>30.2%</b>
<b>Twelve Months Ended</b>							
<b>30 September 2014</b>							
Operating income (loss)	\$762.6	\$351.2	\$310.4	\$(57.3)	\$379.0	\$(78.5)	\$1,667.4
Add: Depreciation and amortization	414.4	220.2	205.3	7.1	99.1	10.8	956.9
Add: Equity affiliates income	60.9	44.1	38.0	5.8	2.6		151.4
<b>Adjusted EBITDA</b>	<b>\$1,237.9</b>	<b>\$615.5</b>	<b>\$553.7</b>	<b>\$(44.4)</b>	<b>\$480.7</b>	<b>\$(67.7)</b>	<b>\$2,775.7</b>
<b>Adjusted EBITDA margin<sup>(A)</sup></b>	<b>30.4%</b>	<b>28.6%</b>	<b>36.3%</b>		<b>23.3%</b>		<b>26.6%</b>
<b>2016 vs. 2015</b>							
Adjusted EBITDA change	\$100.5	\$37.6	\$74.5	\$22.4	\$37.6	\$16.3	\$288.9
Adjusted EBITDA % change	8%	7%	12%	62%	7%	42%	10%
Adjusted EBITDA margin change	670bp	520bp	260bp		280bp		420bp

**2015 vs. 2014**

Adjusted EBITDA change	\$52.0	\$(48.1)	\$75.8	\$8.5	\$91.0	\$29.2	\$208.4
Adjusted EBITDA % change	4%	(8)%	14%	19%	19%	43%	8%
Adjusted EBITDA margin change	450bp	180bp	210bp		410bp		360bp

<sup>(A)</sup> Adjusted EBITDA margin is calculated by dividing Adjusted EBITDA by sales.

**Table of Contents****INCOME TAXES**

The tax impact of our non-GAAP adjustments reflects the expected current and deferred income tax expense impact of the transactions and is impacted primarily by the statutory tax rate of the various relevant jurisdictions and the taxability of the adjustments in those jurisdictions.

	Effective Tax Rate		
	2016	2015	2014
<b>Income Tax Provision GAAP</b>	<b>\$586.5</b>	<b>\$418.3</b>	<b>\$369.4</b>
<b>Income from Continuing Operations before Taxes GAAP</b>	<b>\$2,132.2</b>	<b>\$1,742.7</b>	<b>\$1,365.4</b>
<b>Effective Tax Rate GAAP</b>	<b>27.5%</b>	<b>24.0%</b>	<b>27.1%</b>
Income Tax Provision GAAP	\$586.5	\$418.3	\$369.4
Business separation costs	3.9		
Tax costs associated with business separation	(51.8)		
Business restructuring and cost reduction actions	9.9	54.5	4.5
Pension settlement loss	2.3	7.5	1.9
Goodwill and intangible asset impairment charge			1.3
Gain on previously held equity interest		(6.7)	
Gain on land sales		(5.3)	
Loss on extinguishment of debt	2.6	2.4	
Chilean tax rate change			(20.6)
Tax election benefit			51.6
<b>Income Tax Provision Non-GAAP Measure</b>	<b>\$553.4</b>	<b>\$470.7</b>	<b>\$408.1</b>
Income from Continuing Operations before Taxes GAAP	\$2,132.2	\$1,742.7	\$1,365.4
Business separation costs	52.2	7.5	
Business restructuring and cost reduction actions	33.9	207.7	12.7
Pension settlement loss	6.4	21.2	5.5
Goodwill and intangible asset impairment charge			310.1
Gain on previously held equity interest		(17.9)	
Gain on land sales		(33.6)	
Loss on extinguishment of debt	6.9	16.6	
<b>Income from Continuing Operations Before Taxes Non-GAAP Measure</b>	<b>\$2,231.6</b>	<b>\$1,944.2</b>	<b>\$1,693.7</b>
<b>Effective Tax Rate Non-GAAP Measure</b>	<b>24.8%</b>	<b>24.2%</b>	<b>24.1%</b>



**Table of Contents****LIQUIDITY AND CAPITAL RESOURCES**

We maintained a strong financial position throughout 2016 and as of 30 September 2016 our consolidated balance sheet included cash and cash items of \$1,501.3. The cash and cash items balance is higher than our historical trend and primarily results from transactions related to the anticipated spin-off of Versum and positive operating cash flows. Approximately \$1,000.0 of debt was raised by Versum in September which included a \$575.0 term loan that drove an increase in cash and cash items. We expect our cash balance and cash flows from operating and financing activities to meet liquidity needs for the foreseeable future.

As of 30 September 2016, we had \$545.3 of foreign cash and cash items compared to a total amount of cash and cash items of \$1,501.3. If the foreign cash and cash items are needed for operations in the U.S. or we otherwise elect to repatriate the funds, we may be required to accrue and pay U.S. taxes on a significant portion of these amounts. However, since we have significant current investment plans outside the U.S., it is our intent to permanently reinvest the majority of our foreign cash and cash items outside the U.S. Current financing alternatives do not require the repatriation of foreign funds.

Our cash flows from operating, investing, and financing activities from continuing operations, as reflected in the consolidated statements of cash flows, are summarized in the following table:

	<b>2016</b>	2015	2014
<b>Cash provided by (used for)</b>			
Operating activities	<b>\$2,707.4</b>	\$2,446.4	\$2,190.1
Investing activities	<b>(972.0)</b>	(1,250.5)	(1,316.5)
Financing activities	<b>(271.1)</b>	(945.4)	(504.3)
<b>Operating Activities</b>			

For the year ended 2016, cash provided by operating activities was \$2,707.4. Income from continuing operations of \$1,515.3 included a loss on extinguishment of debt of \$6.9. Income from continuing operations is adjusted for reconciling items that include depreciation and amortization, deferred income taxes, share-based compensation, noncurrent capital lease receivables, and undistributed earnings of unconsolidated affiliates. Other adjustments of \$155.2 were primarily driven by the remeasurement of intercompany transactions as the related hedging instruments that eliminate the earnings impact are included in other receivables and payables and accrued liabilities. The working capital accounts were a use of cash of \$20.1 that were primarily driven by trade receivables and other working capital partially offset by payables and accrued liabilities. The use of cash from other working capital of \$57.4 was primarily driven by advances associated with the purchase of helium. The increase in payables and accrued liabilities of \$57.0 was primarily related to an increase in customer advances which includes payment from our joint venture in Jazan, Saudi Arabia and was partially offset by the changes in the fair value of foreign exchange contracts that hedge intercompany loans.

For the year ended 2015, cash provided by operating activities was \$2,446.4. Income from continuing operations of \$1,284.7 included the write-down of long-lived assets associated with business restructuring of \$47.4, a non-cash gain on the previously held equity interest of \$17.9, and a loss on extinguishment of debt of \$16.6. Other adjustments included pension and postretirement expense of \$141.4 and contributions to our pension plans of \$137.5, primarily for plans in the U.S. and U.K. Management considers various factors when making pension funding decisions, including tax, cash flow, and regulatory implications. The working capital accounts were a source of cash of \$224.7. The increase of payables and accrued liabilities of \$156.2 includes an increase in accrued incentive compensation of \$97.0.

For the year ended 2014, cash provided by operating activities was \$2,190.1. Income from continuing operations of \$994.6 included the goodwill and intangible asset impairment charge of \$310.1. Other adjustments included \$143.2 for pension and other postretirement expense, partially offset by a use of cash of \$78.2 for pension contributions. The working capital accounts were a use of cash of \$250.0. Inventory was a use of cash of \$23.5 primarily due to the timing of helium purchases. The reduction of payables and accrued liabilities of \$237.9 includes \$148.5 for payments associated with projects accounted for as capital leases and \$52.5 of payments related to the 2013 business restructuring and cost reduction plan.

**Table of Contents****Investing Activities**

For the year ended 30 September 2016, cash used for investing activities was \$972.0, driven by capital expenditures for plant and equipment of \$1,055.8. Proceeds from the sale of assets and investments of \$85.5 was primarily driven by the receipt of \$30.0 for our rights to a corporate aircraft that was under construction, \$15.9 for the sale of our 20% equity investment in Daido Air Products Electronics, Inc., and \$14.9 for the sale of a wholly owned subsidiary located in Wuhu, China.

For the year ended 30 September 2015, cash used for investing activities was \$1,250.5, primarily capital expenditures for plant and equipment. On 30 December 2014, we acquired our partner's equity ownership interest in a liquefied atmospheric industrial gases production joint venture in North America which increased our ownership from 50% to 100%. Refer to Note 6, Business Combination, to the consolidated financial statements for additional information.

For the year ended 30 September 2014, cash used for investing activities was \$1,316.5, primarily capital expenditures for plant and equipment. Refer to the Capital Expenditures section below for additional detail.

**Capital Expenditures**

Capital expenditures are detailed in the following table:

	2016	2015	2014
Additions to plant and equipment	<b>\$1,055.8</b>	\$1,265.6	\$1,362.7
Acquisitions, less cash acquired		34.5	
Investments in and advances to unconsolidated affiliates		4.3	(2.0)
<b>Capital Expenditures on a GAAP Basis</b>	<b>\$1,055.8</b>	\$1,304.4	\$1,360.7
Capital lease expenditures <sup>(A)</sup>	<b>27.2</b>	95.6	202.4
Purchase of noncontrolling interests in a subsidiary <sup>(A)</sup>		278.4	.5
<b>Capital Expenditures on a Non-GAAP Basis</b>	<b>\$1,083.0</b>	\$1,678.4	\$1,563.6

<sup>(A)</sup> We utilize a non-GAAP measure in the computation of capital expenditures and include spending associated with facilities accounted for as capital leases and purchases of noncontrolling interests. Certain contracts associated with facilities that are built to provide product to a specific customer are required to be accounted for as leases, and such spending is reflected as a use of cash within cash provided by operating activities, if the arrangement qualifies as a capital lease. Additionally, the purchase of subsidiary shares from noncontrolling interests is accounted for as a financing activity in the statement of cash flows. The presentation of this non-GAAP measure is intended to enhance the usefulness of information by providing a measure that our management uses internally to evaluate and manage our expenditures.

Capital expenditures on a GAAP basis in 2016 totaled \$1,055.8, compared to \$1,265.6 in 2015. The decrease of \$209.8 was primarily due to the completion of major projects in 2016 and 2015. Additions to plant and equipment also included support capital of a routine, ongoing nature, including expenditures for distribution equipment and facility improvements. Spending in 2016 and 2015 included plant and equipment constructed to provide oxygen for coal gasification in China, hydrogen to the global market, oxygen to the steel industry, nitrogen to the electronic semiconductor industry, and capacity expansion for the Materials Technologies segment.

Capital expenditures on a non-GAAP basis in 2016 totaled \$1,083.0 compared to \$1,678.4 in 2015. The decrease of \$595.4 was primarily due to the prior year purchase of the 30.5% equity interest in our Indura S.A. subsidiary from the largest minority shareholder for \$277.9. Refer to Note 21, Noncontrolling Interests, to the consolidated financial

statements for additional details. Additionally, capital lease expenditures of \$27.2, decreased by \$68.4, reflecting lower project spending.

On 19 April 2015, a joint venture between Air Products and ACWA Holding entered into a 20-year oxygen and nitrogen supply agreement to supply Saudi Aramco's oil refinery and power plant being built in Jazan, Saudi Arabia. Air Products owns 25% of the joint venture. During 2016 and 2015, we recorded noncash transactions which resulted in an increase of \$26.9 and \$67.5, respectively, to our investment in net assets of and advances to equity affiliates for our obligation to invest in the joint venture. These noncash transactions have been excluded from the consolidated statements of cash flows. In total, we expect to invest approximately \$100 in this joint venture. Air Products has also entered into a sale of equipment contract with the joint venture to engineer, procure, and construct the industrial gas facilities that will supply the gases to Saudi Aramco.

---

**Table of Contents**

Sales backlog represents our estimate of revenue to be recognized in the future on our share of Air Products' sale of equipment orders and related process technology that are under firm contracts. The sales backlog for the Company at 30 September 2016 was \$1,057, compared to \$1,535 at 30 September 2015. The decrease was driven by progress on the Jazan project and completion of LNG orders.

**2017 Outlook**

Excluding acquisitions, capital expenditures for new plant and equipment in 2017 are expected to be approximately \$1,200. A majority of the total capital expenditures is expected to be for new plants that are currently under construction or expected to start construction. It is anticipated that capital expenditures will be funded principally with cash from continuing operations. In addition, we intend to continue to evaluate acquisition opportunities and investments in equity affiliates.

**Financing Activities**

For the year ended 2016, cash used for financing activities was \$271.1. Our borrowings (short- and long-term proceeds, net of repayments) were a net source of cash (issuance) of \$331.2 and included debt proceeds from the issuance of a .375% Eurobond of \$350 million (\$386.9) on 1 June 2016 and the issuance of a \$575.0 term loan by Versum in anticipation of the spin-off, partially offset by the repayment of long-term debt, including the 2.0% Senior Note of \$350.0 million on 2 August 2016, and a \$144.2 use of cash for net commercial paper and other short-term debt borrowings. Versum distributed in-kind notes with an aggregate principal amount of \$425.0 to Air Products. However, since Air Products exchanged these notes with certain financial institutions for \$418.3 of Air Products' outstanding commercial paper, this non-cash debt for debt exchange was excluded from the consolidated statement of cash flows. Refer to Note 15, Debt, to the consolidated financial statements for additional details. We also used cash to pay dividends of \$721.2 and received proceeds from stock option exercises of \$141.3.

For the year ended 2015, cash used for financing activities was \$945.4 primarily attributable to cash used to pay dividends of \$677.5 and payments for subsidiary shares from noncontrolling interest of \$278.4, which was partially offset by proceeds from stock option exercises of \$121.3. Our borrowings were a net use of cash of \$84.4 and included \$284.0 of net commercial paper and other short-term debt issuances, debt proceeds from the issuance of a 1.0% Eurobond of \$300 million (\$335.3), repayment of a 3.875% Eurobond of \$300 million (\$335.9), repayment of Industrial Revenue Bonds totaling \$147.2, and repayment of 3,000,000 Unidades de Fomento ( UF ) Series E 6.30% Bonds totaling \$146.6. Refer to Note 15, Debt, to the consolidated financial statements for additional details.

For the year ended 2014, cash used for financing activities was \$504.3 primarily attributable to cash used to pay dividends of \$627.7 which was partially offset by proceeds from stock options exercised of \$141.6. Our borrowings were a net use of cash (issuance) of \$3.5 and included \$148.7 of net commercial paper and other short-term debt issuances, debt proceeds from the issuance of a \$400 senior fixed-rate 3.35% note on 31 July 2014 and \$61.0 of other, primarily international, debt issuances and debt repayments of a 3.75% Eurobond of \$300 million (\$401.0) in November 2013 and \$207.6 of other, primarily international, debt.

**Discontinued Operations**

For the year ended 2016, discontinued operations primarily includes the Energy-from-Waste business which the Company decided to exit in the second quarter of 2016. Cash used by discontinued operations was \$176.9 primarily driven by capital expenditures for plant and equipment of \$97.0 and the loss from discontinued operations of \$37.6. Refer to Note 4, Discontinued Operations, to the consolidated financial statements for additional information.

For the year ended 2015, cash used by discontinued operations was \$357.8. The use of cash was primarily driven by expenditures for plant and equipment of \$349.2 related to the Energy-from-Waste facilities. Refer to Note 4, Discontinued Operations, to the consolidated financial statements for additional information.

For the year ended 2014, cash used by discontinued operations was \$471.8. The use of cash was driven by capital expenditures of \$321.5 for our Energy-from-Waste facilities and a payment made to the Linde Group for contingent proceeds we were obligated to return from the sale of our Homecare business of \$157.1. Refer to Note 4, Discontinued Operations, to the consolidated financial statements for additional information.

## **Table of Contents**

### **Financing and Capital Structure**

Capital needs in 2016 were satisfied primarily with cash from operations. At the end of 2016, total debt outstanding was \$6,225.2 compared to \$5,879.0 at the end of 2015, and cash and cash items were \$1,501.3 compared to \$206.4 at the end of 2015. Total debt at 30 September 2016 and 2015, expressed as a percentage of total capitalization (total debt plus total equity), was 46.3% and 44.3%, respectively.

During fiscal 2013, we entered into a five-year \$2,500.0 revolving credit agreement maturing 30 April 2018 with a syndicate of banks (the 2013 Credit Agreement), under which senior unsecured debt is available to both the Company and certain of its subsidiaries. There have been subsequent amendments to the 2013 Credit Agreement, and as of 30 September 2016, the maximum borrowing capacity was \$2,690.0. The 2013 Credit Agreement provides a source of liquidity for the Company and supports its commercial paper program. This credit facility includes a financial covenant for a maximum ratio of total debt to total capitalization no greater than 70%. No borrowings were outstanding under the 2013 Credit Agreement as of 30 September 2016.

During September 2016, in anticipation of the Versum spin-off, Versum entered into certain financing transactions to allow for a cash distribution of \$550.0 and a distribution in-kind of notes issued by Versum with an aggregate principal amount of \$425.0 to Air Products. Air Products then exchanged these notes with certain financial institutions for \$418.3 of Air Products' outstanding commercial paper. Since Versum debt was issued in September but Versum did not become a separate entity until 1 October 2016, Air Products' consolidated balance sheet includes the Versum debt. The \$575.0 term loan and the \$425.0 of notes were included in the Versum spin-off transaction and do not represent obligation of the Company in the future. In addition, Versum entered into a senior secured first lien revolving credit facility (Versum Revolving Facility) in an aggregate principal amount of \$200.0 that matures on 30 September 2021. Lenders under the Revolving Facility have a maximum first lien net leverage ratio covenant (total debt net of cash on hand to total adjusted EBITDA) of 3.25:1.00 and certain other customary covenants. No borrowings were outstanding on the Versum Revolving Facility as of 30 September 2016. Refer to Note 3, Materials Technologies Separation, to the consolidated financial statements for additional details.

Commitments totaling \$51.3 are maintained by our foreign subsidiaries, all of which was borrowed and outstanding at 30 September 2016.

As of 30 September 2016, we are in compliance with all of the financial and other covenants under our debt agreements.

On 15 September 2011, the Board of Directors authorized the repurchase of up to \$1,000 of our outstanding common stock. We did not purchase any of our outstanding shares during fiscal years 2016, 2015 or 2014. At 30 September 2016, \$485.3 in share repurchase authorization remains.

### **2017 Outlook**

Cash flows from operations and financing activities are expected to meet liquidity needs for the foreseeable future and our working capital balance was \$1,034.0 at 30 September 2016. We expect that we will continue to be in compliance with all of our financial covenants.

We expect to utilize the proceeds from the distribution from Versum to pay down debt, largely commercial paper, in the first quarter of fiscal 2017.

### **Dividends**

Dividends are declared by the Board of Directors and are usually paid during the sixth week after the close of the fiscal quarter. During 2016, the Board of Directors increased the quarterly dividend from \$.81 per share to \$.86 per share.



**Table of Contents****CONTRACTUAL OBLIGATIONS**

We are obligated to make future payments under various contracts, such as debt agreements, lease agreements, unconditional purchase obligations, and other long-term obligations. The following table summarizes our obligations as of 30 September 2016:

	Total	2017	2018	2019	2020	2021	Thereafter
Long-term debt obligations							
Debt maturities	\$5,289	\$371	\$419	\$407	\$353	\$417	\$3,322
Contractual interest	880	131	119	117	99	91	323
Capital leases	31	2	1	2	2	3	21
Operating leases	355	71	62	50	38	32	102
Pension obligations	1,211	67	50	51	52	56	935
Unconditional purchase obligations	5,331	942	525	307	298	276	2,983
Obligation for future contribution to an equity affiliate	100				100		
<b>Total Contractual Obligations</b>	<b>\$13,197</b>	<b>\$1,584</b>	<b>\$1,176</b>	<b>\$934</b>	<b>\$942</b>	<b>\$875</b>	<b>\$7,686</b>

**Long-Term Debt Obligations**

The long-term debt obligations include the maturity payments of long-term debt, including current portion, and the related contractual interest obligations. Refer to Note 15, Debt, to the consolidated financial statements for additional information on long-term debt.

Contractual interest is the interest we are contracted to pay on the long-term debt obligations without taking into account the interest impact of interest rate swaps related to any of this debt, which at current interest rates would slightly decrease contractual interest. We had \$1,396 of long-term debt subject to variable interest rates at 30 September 2016, excluding fixed-rate debt that has been swapped to variable-rate debt. The rate assumed for the variable interest component of the contractual interest obligation was the rate in effect at 30 September 2016. Variable interest rates are primarily determined by interbank offer rates and by U.S. short-term tax-exempt interest rates.

Consistent with the debt maturities table within Note 15, Debt, the long-term debt obligations reflect financing entered into in anticipation of the spin-off of EMD as Versum Materials, Inc. The spin-off was completed on 1 October 2016 and the related debt of \$997.2 was maintained by Versum.

**Leases**

Refer to Note 12, Leases, to the consolidated financial statements for additional information on capital and operating leases.

**Pension Obligations**

The amounts in the table above represent the current estimated cash payments to be made by us that in total equal the recognized pension liabilities. Refer to Note 16, Retirement Benefits, to the consolidated financial statements. These payments are based upon the current valuation assumptions and regulatory environment.

The total accrued liability for pension benefits is impacted by interest rates, plan demographics, actual return on plan assets, continuation or modification of benefits, and other factors. Such factors can significantly impact the amount of the liability and related contributions.

### **Unconditional Purchase Obligations**

Approximately \$4,000 of our unconditional purchase obligations relate to helium purchases, which include crude feedstock supply to multiple helium refining plants in North America as well as refined helium purchases from sources around the world. As a rare byproduct of natural gas production in the energy sector, these helium sourcing agreements are medium- to long-term and contain take-or-pay provisions. The refined helium is distributed globally and sold as a merchant gas, primarily under medium-term requirements contracts. While contract terms in the energy sector are longer than those in merchant, helium is a rare gas used in applications with few or no substitutions because of its unique physical and chemical properties.

Approximately \$330 of our long-term unconditional purchase obligations relate to feedstock supply for numerous HyCO (hydrogen, carbon monoxide, and syngas) facilities. The price of feedstock supply is principally related to

## **Table of Contents**

the price of natural gas. However, long-term take-or-pay sales contracts to HyCO customers are generally matched to the term of the feedstock supply obligations and provide recovery of price increases in the feedstock supply. Due to the matching of most long-term feedstock supply obligations to customer sales contracts, we do not believe these purchase obligations would have a material effect on our financial condition or results of operations. Refer to Note 17, Commitments and Contingencies, to the consolidated financial statements for additional information on our unconditional purchase obligations.

The unconditional purchase obligations also include other product supply and purchase commitments and electric power and natural gas supply purchase obligations, which are primarily pass-through contracts with our customers.

Purchase commitments to spend approximately \$350 for additional plant and equipment are included in the unconditional purchase obligations in 2017. In addition, we have purchase commitments totaling approximately \$500 in 2017 and 2018 relating to our long-term sale of equipment project for Saudi Aramco's Jazan oil refinery.

We also purchase materials, energy, capital equipment, supplies, and services as part of the ordinary course of business under arrangements that are not unconditional purchase obligations. The majority of such purchases are for raw materials and energy, which are obtained under requirements-type contracts at market prices.

### **Obligation for Future Contribution to an Equity Affiliate**

On 19 April 2015, a joint venture between Air Products and ACWA Holding entered into a 20-year oxygen and nitrogen supply agreement to supply Saudi Aramco's oil refinery and power plant being built in Jazan, Saudi Arabia. Air Products owns 25% of the joint venture and guarantees the repayment of its share of an equity bridge loan. In total, we expect to invest approximately \$100 in this joint venture. As of 30 September 2016, we recorded a noncurrent liability of \$94.4 for our obligation to make future equity contributions based on our proportionate share of the advances received by the joint venture under the loan.

### **Income Tax Liabilities**

Noncurrent deferred income tax liabilities as of 30 September 2016 were \$767.1. Tax liabilities related to unrecognized tax benefits as of 30 September 2016 were \$106.9. These tax liabilities were excluded from the Contractual Obligations table, as it is impractical to determine a cash impact by year given that payments will vary according to changes in tax laws, tax rates, and our operating results. In addition, there are uncertainties in timing of the effective settlement of our uncertain tax positions with respective taxing authorities. Refer to Note 23, Income Taxes, to the consolidated financial statements for additional information.

### **PENSION BENEFITS**

The Company and certain of its subsidiaries sponsor defined benefit pension plans and defined contribution plans that cover a substantial portion of its worldwide employees. The principal defined benefit pension plans are the U.S. salaried pension plan and the U.K. pension plan. These plans were closed to new participants in 2005 and were replaced with defined contribution plans. Over the long run, the shift to defined contribution plans is expected to reduce volatility of both plan expense and contributions.

The fair market value of plan assets for our defined benefit pension plans as of the 30 September 2016 measurement date increased to \$4,116.4 from \$3,916.4 at the end of fiscal year 2015. The projected benefit obligation for these plans was \$5,327.3 and \$4,787.8 at the end of the fiscal years 2016 and 2015, respectively. The net unfunded liability increased by approximately \$340 from \$871 to \$1,211 due primarily to lower discount rates. Refer to Note 16,

Retirement Benefits, to the consolidated financial statements for comprehensive and detailed disclosures on our postretirement benefits.

**Table of Contents****Pension Expense**

	<b>2016</b>	2015	2014
Pension expense	<b>\$68.1</b>	\$135.6	\$135.9
Special terminations, settlements, and curtailments (included above)	<b>7.3</b>	35.2	5.8
Weighted average discount rate <sup>(A)</sup>	<b>4.1%</b>	4.0%	4.6%
Weighted average expected rate of return on plan assets	<b>7.5%</b>	7.4%	7.7%
Weighted average expected rate of compensation increase	<b>3.5%</b>	3.5%	3.9%

<sup>(A)</sup> Effective in 2016, the Company began to measure the service cost and interest cost components of pension expense 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. The Company has accounted for this as a change in accounting estimate and, accordingly has accounted for it on a prospective basis. This change does not affect the measurement of the total benefit obligation.

**2016 vs. 2015**

Pension expense, excluding special items, decreased from the prior year due to the adoption of the spot rate approach which reduced service cost and interest cost, the impact from expected return on assets and demographic gains, partially offset by the impact of the adoption of new mortality tables for our major plans. Special items of \$7.3 included pension settlement losses of \$6.4, special termination benefits of \$2.0, and curtailment gains of \$1.1. These resulted primarily from our recent business restructuring and cost reduction actions.

**2015 vs. 2014**

The decrease in pension expense, excluding special items, was due to the impact from expected return on assets, a 40 bp reduction in the weighted average compensation increase assumption, and lower service cost and interest cost. The decrease was partially offset by the impact of higher amortization of actuarial losses, which resulted primarily from a 60 bp decrease in weighted average discount rate. Special items of \$35.2 included pension settlement losses of \$21.2, special termination benefits of \$8.7, and curtailment losses of \$5.3. These resulted primarily from our recent business restructuring and cost reduction actions.

**2017 Outlook**

In 2017, pension expense, excluding special items, is estimated to be approximately \$70 to \$75, an increase of \$10 to \$15 from 2016, resulting primarily from a decrease in discount rates, offset by favorable asset experience, effects of the Versum spin-off and the adoption of new mortality tables. Pension settlement losses of \$10 to \$15 are expected, dependent on the timing of retirements. In 2017, we expect pension expense to include approximately \$164 for amortization of actuarial losses compared to \$121 in 2016. Net actuarial losses of \$484 were recognized in accumulated other comprehensive income in 2016, primarily attributable to lower discount rates and improved mortality projections. Actuarial gains/losses are amortized into pension expense over prospective periods to the extent they are not offset by future gains or losses. Future changes in the discount rate and actual returns on plan assets different from expected returns would impact the actuarial gains/losses and resulting amortization in years beyond 2017.

During the first quarter of 2017, the Company expects to record a curtailment loss estimated to be \$5 to \$10 related to employees transferring to Versum. The loss will be reflected in the results from discontinued operations on the consolidated income statements. We continue to evaluate opportunities to manage the liabilities associated with our

pension plans.

### **Pension Funding**

Pension funding includes both contributions to funded plans and benefit payments for unfunded plans, which are primarily non-qualified plans. With respect to funded plans, our funding policy is that contributions, combined with appreciation and earnings, will be sufficient to pay benefits without creating unnecessary surpluses.

In addition, we make contributions to satisfy all legal funding requirements while managing our capacity to benefit from tax deductions attributable to plan contributions. With the assistance of third party actuaries, we analyze the liabilities and demographics of each plan, which help guide the level of contributions. During 2016 and 2015, our cash contributions to funded plans and benefit payments for unfunded plans were \$79.3 and \$137.5, respectively.

For 2017, cash contributions to defined benefit plans are estimated to be \$65 to \$85. The estimate is based on expected contributions to certain international plans and anticipated benefit payments for unfunded plans, which

## **Table of Contents**

are dependent upon the timing of retirements and future cost reduction actions. Actual future contributions will depend on future funding legislation, discount rates, investment performance, plan design, and various other factors. Refer to the Contractual Obligations discussion on page 45 for a projection of future contributions.

## **ENVIRONMENTAL MATTERS**

We are subject to various environmental laws and regulations in the countries in which we have operations. Compliance with these laws and regulations results in higher capital expenditures and costs. In the normal course of business, we are involved in legal proceedings under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA: the federal Superfund law); Resource Conservation and Recovery Act (RCRA); and similar state and foreign environmental laws relating to the designation of certain sites for investigation or remediation. Our accounting policy for environmental expenditures is discussed in Note 1, Major Accounting Policies, to the consolidated financial statements, and environmental loss contingencies are discussed in Note 17, Commitments and Contingencies, to the consolidated financial statements.

The amounts charged to income from continuing operations related to environmental matters totaled \$27.0, \$28.3, and \$35.1 in 2016, 2015, and 2014, respectively. These amounts represent an estimate of expenses for compliance with environmental laws and activities undertaken to meet internal Company standards. Future costs are not expected to be materially different from these amounts. Refer to Note 17, Commitments and Contingencies, to the consolidated financial statements for additional information.

Although precise amounts are difficult to determine, we estimate that we spent \$7 and \$4 in 2016 and 2015, respectively, on capital projects to control pollution. Capital expenditures to control pollution in future years are estimated to be approximately \$3 in both 2017 and 2018.

We accrue environmental investigatory and remediation costs for identified sites when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. The potential exposure for such costs is estimated to range from \$81 to a reasonably possible upper exposure of \$95 as of 30 September 2016. The consolidated balance sheets at 30 September 2016 and 2015 included an accrual of \$81.4 and \$80.6, respectively. The accrual for the environmental obligations includes amounts for the Pace, Florida; Piedmont, South Carolina; and Pasadena, Texas, locations which were a part of previously divested chemicals businesses. Refer to Note 17, Commitments and Contingencies, to the consolidated financial statements for further details on these facilities.

Actual costs to be incurred at identified sites in future periods may vary from the estimates, given inherent uncertainties in evaluating environmental exposures. Subject to the imprecision in estimating future environmental costs, we do not expect that any sum we may have to pay in connection with environmental matters in excess of the amounts recorded or disclosed above would have a material adverse impact on our financial position or results of operations in any one year.

Some of our operations are within jurisdictions that have or are developing regulations governing emissions of greenhouse gases (GHG). These include existing and expanding coverage under the European Union Emissions Trading Scheme, California's cap and trade scheme, South Korea's Emission Trading Scheme, Alberta's Specified Gases Emitter Regulation and, beginning in 2017, the Ontario cap and trade scheme and China National Emission Trading Scheme. Where these regulations impose compliance costs on our hydrogen production facilities (California, Alberta, and Ontario), we have been able to mitigate the majority of such costs through our contractual terms.

Increased public awareness and concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHG. Although uncertain, these developments could increase our costs related to

consumption of electric power, hydrogen production, and fluorinated gases production. We believe we will be able to mitigate some of the potential costs through our contractual terms, but the lack of definitive legislation or regulatory requirements in some of the jurisdictions where we operate prevents accurate prediction of the long-term impact on us. Any legislation that limits or taxes GHG emissions from our facilities could impact our growth by increasing our operating costs or reducing demand for certain of our products.

Regulation of GHG may also produce new opportunities for us. We continue to develop technologies to help our facilities and our customers lower energy consumption, improve efficiency, and lower emissions. We are also developing a portfolio of technologies that capture carbon dioxide from power and chemical plants before it reaches the atmosphere, enable cleaner transportation fuels, and facilitate alternate fuel source development. In



## **Table of Contents**

addition, the potential demand for clean coal and our carbon capture solutions could increase demand for oxygen, one of our main products, and our proprietary technology for delivering low-cost oxygen.

### **OFF-BALANCE SHEET ARRANGEMENTS**

We have entered into certain guarantee agreements as discussed in Note 17, Commitments and Contingencies, to the consolidated financial statements. We are not a primary beneficiary in any material variable interest entity. Our off-balance sheet arrangements are not reasonably likely to have a material impact on financial condition, changes in financial condition, results of operations, or liquidity.

### **RELATED PARTY TRANSACTIONS**

Our principal related parties are equity affiliates operating in the industrial gas business. In 2015, we entered into a long-term sale of equipment contract to engineer, procure, and construct industrial gas facilities with a 25% owned joint venture for Saudi Aramco's Jazan oil refinery and power plant in Saudi Arabia. The agreement included terms that are consistent with those that we believe would have been negotiated at an arm's length with an independent party. Sales related to this contract are included in the results of our Industrial Gases Global segment and were approximately \$300 during fiscal year 2016 and were not material during fiscal year 2015.

### **INFLATION**

We operate in many countries that experience volatility in inflation and foreign exchange rates. The ability to pass on inflationary cost increases is an uncertainty due to general economic conditions and competitive situations. It is estimated that the cost of replacing our plant and equipment today is greater than its historical cost. Accordingly, depreciation expense would be greater if the expense were stated on a current cost basis.

### **CRITICAL ACCOUNTING POLICIES AND ESTIMATES**

Note 1, Major Accounting Policies, to the consolidated financial statements describes our major accounting policies. Judgments and estimates of uncertainties are required in applying our accounting policies in many areas. However, application of the critical accounting policies discussed below requires management's significant judgments, often as the result of the need to make estimates of matters that are inherently uncertain. If actual results were to differ materially from the estimates made, the reported results could be materially affected. Our management has reviewed these critical accounting policies and estimates and related disclosures with our audit committee.

#### **Depreciable Lives of Plant and Equipment**

Net plant and equipment at 30 September 2016 totaled \$8,852.7, and depreciation expense totaled \$893.0 during 2016. Plant and equipment is recorded at cost and depreciated using the straight-line method, which deducts equal amounts of the cost of each asset from earnings every year over its estimated economic useful life.

Economic useful life is the duration of time an asset is expected to be productively employed by us, which may be less than its physical life. Assumptions on the following factors, among others, affect the determination of estimated economic useful life: wear and tear, obsolescence, technical standards, contract life, market demand, competitive position, raw material availability, and geographic location.

The estimated economic useful life of an asset is monitored to determine its appropriateness, especially in light of changed business circumstances. For example, changes in technology, changes in the estimated future demand for

products, or excessive wear and tear may result in a shorter estimated useful life than originally anticipated. In these cases, we would depreciate the remaining net book value over the new estimated remaining life, thereby increasing depreciation expense per year on a prospective basis. Likewise, if the estimated useful life is increased, the adjustment to the useful life decreases depreciation expense per year on a prospective basis.

The regional Industrial Gases segments have numerous long-term customer supply contracts for which we construct an on-site plant adjacent to or near the customer's facility. These contracts typically have initial contract terms of 10 to 20 years. Depreciable lives of the production assets related to long-term contracts are matched to the contract lives. Extensions to the contract term of supply frequently occur prior to the expiration of the initial term. As contract terms are extended, the depreciable life of the remaining net book value of the production assets is adjusted to match the new contract term, as long as it does not exceed the remaining physical life of the asset.

Our regional Industrial Gases segments also have contracts for liquid or gaseous bulk supply and, for smaller customers, packaged gases. The depreciable lives of production facilities associated with these contracts are

**Table of Contents**

generally 15 years. The depreciable lives of production facilities within the Materials Technologies segment, where there is not an associated long-term supply agreement, range from 10 to 15 years. These depreciable lives have been determined based on historical experience combined with judgment on future assumptions such as technological advances, potential obsolescence, competitors' actions, etc. Management monitors its assumptions and may potentially need to adjust depreciable life as circumstances change.

A change in the weighted average remaining depreciable life by one year for assets associated with our regional Industrial Gases segments and Materials Technologies segment would impact annual depreciation expense as summarized below:

	Decrease Life By 1 Year	Increase Life By 1 Year
Industrial Gases - Regional	\$36	\$(31)
Materials Technologies	\$4	\$(3)

**Impairment of Assets****Plant and Equipment**

Plant and equipment held for use is grouped for impairment testing at the lowest level for which there is identifiable cash flows. Impairment testing of the asset group occurs whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Such circumstances would include a significant decrease in the market value of a long-lived asset grouping, a significant adverse change in the manner in which the asset grouping is being used or in its physical condition, an accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the long-lived asset, a history of operating or cash flow losses associated with the use of the asset grouping, or changes in the expected useful life of the long-lived assets.

If such circumstances are determined to exist, an estimate of undiscounted future cash flows produced by that asset group is compared to the carrying value to determine whether impairment exists. If an asset group is determined to be impaired, the loss is measured based on the difference between the asset group's fair value and its carrying value. An estimate of the asset group's fair value is based on the discounted value of its estimated cash flows. Assets that meet the held for sale criteria are reported at the lower of carrying amount or fair value less cost to sell.

The assumptions underlying the undiscounted future cash flow projections require significant management judgment. Factors that management must estimate include industry and market conditions, sales volume and prices, costs to produce, inflation, etc. The assumptions underlying the cash flow projections represent management's best estimates at the time of the impairment review. Changes in key assumptions or actual conditions that differ from estimates could result in an impairment charge. We use reasonable and supportable assumptions when performing impairment reviews and cannot predict the occurrence of future events and circumstances that could result in impairment charges.

On 29 March 2016, the Board of Directors approved the Company's exit of its Energy-from-Waste business. Accordingly, we assessed the recoverability of capital costs for the two projects associated with this business and recorded an impairment charge of \$913.5 to reduce the carrying values of plant assets to their estimated net realizable value of \$20. We estimated the net realizable value of the projects assuming an orderly liquidation of assets capable of being marketed on a secondary equipment market based on market quotes and our experience with selling similar equipment. An asset's orderly liquidation value is the amount that could be realized from a liquidation sale, given a reasonable period of time to find a buyer, selling the asset in the existing condition where it is located, and assuming

the highest and best use of the asset by market participants. The valuation includes inputs that are unobservable and therefore considered Level 3 inputs in the fair value hierarchy. The loss was measured as the difference between the orderly liquidation value of the assets and the net book value of the assets. Refer to Note 4, Discontinued Operations, for additional information. There have been no significant changes in the estimated net realizable value as of 30 September 2016.

### **Goodwill**

The acquisition method of accounting for business combinations requires us to make use of estimates and judgments to allocate the purchase price paid for acquisitions to the fair value of the net tangible and identifiable

---

**Table of Contents**

intangible assets. Goodwill represents the excess of the aggregate purchase price over the fair value of identifiable net assets of an acquired entity. Goodwill was \$1,150.2 as of 30 September 2016. Disclosures related to goodwill are included in Note 10, Goodwill, to the consolidated financial statements.

We review goodwill for impairment annually in the fourth quarter of the fiscal year and whenever events or changes in circumstances indicate the need for more frequent testing. The tests are done at the reporting unit level, which is defined as being equal to or one level below the operating segment for which discrete financial information is available and whose operating results are reviewed by segment managers regularly. As of 30 September 2016, we had six business segments and thirteen reporting units. Reporting units are primarily based on products and subregions within each business segment. The majority of our goodwill is assigned to reporting units within the three regional Industrial Gases segments and the Materials Technologies segment.

As part of the goodwill impairment testing, we have the option to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. If we choose not to complete a qualitative assessment for a given reporting unit, or if the initial assessment indicates that it is more likely than not that the carrying value of a reporting unit exceeds its estimated fair value, a two-step quantitative test is required. We chose to bypass the qualitative assessment and conduct quantitative testing, as further described below.

The first step of the quantitative test requires that we compare the fair value of our reporting units to their carrying value, including assigned goodwill. To determine the fair value of a reporting unit, we initially use an income approach valuation model, representing the present value of estimated future cash flows. Our valuation model uses a discrete growth period and an estimated exit trading multiple. The income approach is an appropriate valuation method due to our capital-intensive nature, the long-term contractual nature of our business, and the relatively consistent cash flows generated by our reporting units. The principal assumptions utilized in our income approach valuation model include revenue growth rates, operating profit margins, discount rate, and exit multiple. Projected revenue growth rates and operating profit assumptions are consistent with those utilized in our operating plan and long-term financial planning process. The discount rate assumption is calculated based on an estimated market-participant risk-adjusted weighted-average cost of capital, which includes factors such as the risk-free rate of return, cost of debt, and expected equity premiums. The exit multiple is determined from comparable industry transactions and where appropriate, reflects expected long-term growth rates. If our initial review under the income approach indicates there may be impairment, we incorporate results under the market approach to further evaluate the existence of impairment. When the market approach is utilized, fair value is estimated based on market multiples of revenue and earnings derived from comparable publicly-traded industrial gases companies engaged in the same or similar lines of business as the reporting unit, adjusted to reflect differences in size and growth prospects. When both the income and market approach are utilized, we review relevant facts and circumstances and make a qualitative assessment to determine the proper weighting. Management judgment is required in the determination of each assumption utilized in the valuation model, and actual results could differ from the estimates.

If the estimated fair value of the reporting unit is less than the carrying value, we perform the second step of the impairment test to measure the amount of impairment loss, if any. In the second step, the reporting unit's fair value is allocated to all of the assets and liabilities of the reporting unit, including any unrecognized intangible assets, in an analysis that calculates the implied fair value of goodwill in the same manner as if the reporting unit were being acquired in a business combination. If the implied fair value of the reporting unit's goodwill is less than the carrying value, the difference is recorded as an impairment loss.

In 2014, we conducted our annual goodwill impairment testing as of 1 July 2014 and concluded that the goodwill associated with the Latin America reporting unit was impaired and recorded a non-cash impairment charge of \$305.2. The Latin America reporting unit is composed predominately of our Indura business with business units in Chile,

Colombia, and other Latin America countries, which the Company acquired in 2012.

During the fourth quarter of 2016, we conducted our annual goodwill impairment testing noting no indications of impairment. The fair value of all of our reporting units substantially exceeded their carrying value.

The excess of fair value over carrying value for our reporting units ranged from approximately 30% to approximately 350%. Management judgment is required in the determination of each assumption utilized in the valuation model, and actual results could differ from the estimates. In order to evaluate the sensitivity of the fair value calculation on the goodwill impairment test, we applied a hypothetical 10% decrease to the fair value of

## **Table of Contents**

these reporting units. In this scenario, the fair value of our reporting units continued to exceed their carrying value by a range of approximately 15% to 300%.

Future events that could have a negative impact on the level of excess fair value over carrying value of the reporting units include, but are not limited to: long-term economic weakness, decline in market share, pricing pressures, inability to successfully implement cost improvement measures, increases to our cost of capital, and changes to the structure of our business as a result of future reorganizations or divestitures of assets or businesses. Negative changes in one or more of these factors, among others, could result in impairment charges.

We will continue to evaluate goodwill on an annual basis as of the beginning of our fourth fiscal quarter and whenever there are indicators of potential impairment, such as significant adverse changes in business climate or operating results or changes in management's business outlook or strategy.

## **Intangible Assets**

Intangible assets with determinable lives at 30 September 2016 totaled \$425.3 and consisted primarily of customer relationships, purchased patents and technology, and land use rights. These intangible assets are tested for impairment as part of the long-lived asset grouping impairment tests. Impairment testing of the asset group occurs whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. See the impairment discussion above under Plant and Equipment for a description of how impairment losses are determined.

Indefinite-lived intangible assets at 30 September 2016 totaled \$62.7 and consisted of trade names and trademarks. Indefinite-lived intangibles are subject to impairment testing at least annually or more frequently if events or changes in circumstances indicate that potential impairment exists. The impairment test for indefinite-lived intangible assets encompasses calculating the fair value of the indefinite-lived intangible assets and comparing the fair value to their carrying value. If the fair value is less than the carrying value, the difference is recorded as an impairment loss. To determine fair value, we utilize the royalty savings method, a form of the income approach. This method values an intangible asset by estimating the royalties avoided through ownership of the asset.

In the fourth quarter of 2014, we conducted our annual impairment test and determined that our indefinite-lived intangible assets were impaired. Refer to Note 11, Intangible Assets, to the consolidated financial statements for additional information.

In the fourth quarter of 2016, we conducted our annual impairment test of indefinite-lived intangibles and found no indications of impairment.

## **Equity Investments**

Investments in and advances to equity affiliates totaled \$1,288.1 at 30 September 2016. The majority of our investments are non-publicly traded ventures with other companies in the industrial gas business. Summarized financial information of equity affiliates is included in Note 8, Summarized Financial Information of Equity Affiliates, to the consolidated financial statements. Equity investments are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be recoverable.

In the event that a decline in fair value of an investment occurs, and the decline in value is considered to be other than temporary, an impairment loss would be recognized. Management's estimate of fair value of an investment is based on estimated discounted future cash flows expected to be generated by the investee. Changes in key assumptions about the financial condition of an investee or actual conditions that differ from estimates could result in an impairment

charge.

**Revenue Recognition- *Percentage-of-Completion Method***

Revenue from equipment sale contracts is recorded primarily using the percentage-of-completion method. Under this method, revenue from the sale of major equipment, such as liquefied natural gas (LNG) heat exchangers and large air separation units, is recognized based on labor hours or costs incurred to date compared with total estimated labor hours or costs to be incurred, depending on the nature of the project and the best measure of progress toward completion. We estimate the profit on a contract as the difference between the total estimated revenue and expected costs to complete the contract and recognize the profit over the life of the contract.

Accounting for contracts using the percentage-of-completion method requires management judgment relative to assessing risks and their impact on the estimate of revenues and costs. Our estimates are impacted by factors



## **Table of Contents**

such as the potential for incentives or penalties on performance, schedule and technical issues, labor productivity, the complexity of work performed, the cost and availability of materials, and performance of subcontractors. When adjustments in estimated total contract revenues or estimated total costs or labor hours are required, any changes in the estimated profit from prior estimates are recognized in the current period for the inception-to-date effect of such change. When estimates of total costs to be incurred on a contract exceed estimates of total revenues to be earned, a provision for the entire estimated loss on the contract is recorded in the period in which the loss is determined.

Our Jazan large air separation unit sale of equipment project within our Industrial Gases Global segment spans several years. In addition to the typical risks associated with underlying performance of project procurement and construction activities, this project requires monitoring of risks associated with schedule, geography, and other aspects of the contract and their effects on our estimates of total revenues and total costs to complete the contract. Given the revenue and cost uncertainties associated with these risks, we recognized revenue and cost with no estimated profit through the third quarter of 2016. During the fourth quarter of 2016, as a result of progress toward completion and a reassessment of revenue and cost risks, we changed our estimated profit on the project and recognized the inception-to-date effect of that change associated with approximately \$300 of revenue.

Changes in estimates on projects accounted for under the percentage-of-completion method, including the Jazan project, favorably impacted operating income by approximately \$20 in fiscal year 2016, primarily during the fourth quarter. Our changes in estimates would not have significantly impacted amounts recorded in prior years. Changes in estimates during fiscal years 2015 and 2014 were not significant.

We assess the performance of our sale of equipment projects as they progress. Our earnings could be positively or negatively impacted by changes to our forecast of revenues and costs on these projects.

## **Income Taxes**

We account for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the tax effects of temporary differences between the financial reporting and tax bases of assets and liabilities measured using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. At 30 September 2016, accrued income taxes and net deferred tax liabilities amounted to \$146.6 and \$574.4, respectively. Tax liabilities related to uncertain tax positions as of 30 September 2016 were \$106.9, excluding interest and penalties. Income tax expense for the year ended 30 September 2016 was \$586.5. Disclosures related to income taxes are included in Note 23, Income Taxes, to the consolidated financial statements.

Management judgment is required concerning the ultimate outcome of tax contingencies and the realization of deferred tax assets.

Actual income taxes paid may vary from estimates, depending upon changes in income tax laws, actual results of operations, and the final audit of tax returns by taxing authorities. Tax assessments may arise several years after tax returns have been filed. We believe that our recorded tax liabilities adequately provide for these assessments.

Deferred tax assets are recorded for operating losses and tax credit carryforwards. However, when we do not expect sufficient sources of future taxable income to realize the benefit of the operating losses or tax credit carryforwards, these deferred tax assets are reduced by a valuation allowance. A valuation allowance is recognized if, based on the weight of available evidence, it is considered more likely than not that some portion or all of the deferred tax asset will not be realized. The factors used to assess the likelihood of realization include forecasted future taxable income and available tax planning strategies that could be implemented to realize or renew net deferred tax assets in order to avoid the potential loss of future tax benefits. The effect of a change in the valuation allowance is reported in the

income tax expense.

A 1% point increase/decrease in our effective tax rate would decrease/increase net income by approximately \$21.

### **Pension and Other Postretirement Benefits**

The amounts recognized in the consolidated financial statements for pension and other postretirement benefits are determined on an actuarial basis utilizing numerous assumptions. The discussion that follows provides information on the significant assumptions and expense associated with the defined benefit plans.

---

**Table of Contents**

Actuarial models are used in calculating the expense and liability related to the various defined benefit plans. These models have an underlying assumption that the employees render service over their service lives on a relatively consistent basis; therefore, the expense of benefits earned should follow a similar pattern.

Several assumptions and statistical variables are used in the models to calculate the expense and liability related to the plans. We determine assumptions about the discount rate, the expected rate of return on plan assets, and the rate of compensation increase. Note 16, Retirement Benefits, to the consolidated financial statements includes disclosure of these rates on a weighted-average basis for both the domestic and international plans. The actuarial models also use assumptions about demographic factors such as retirement age, mortality, and turnover rates. We believe the actuarial assumptions are reasonable. However, actual results could vary materially from these actuarial assumptions due to economic events and different rates of retirement, mortality, and turnover. In fiscal year 2016, the beginning-of-year projected benefit obligation and benefit costs for the U.S. plans reflect the adoption of the new Society of Actuaries RP-2014 mortality table projected with Scale BB-2D. As of 30 September 2016, the projected benefit obligation reflects the adoption of the new mortality projection scale MP-2016 for the U.S. plans. Our mortality assumptions will differ from the IRS mortality assumptions used to determine funding valuations, as the IRS is not expected to adopt the new tables until 2018 or later.

One of the assumptions used in the actuarial models is the discount rate used to measure benefit obligations. This rate reflects the prevailing market rate for high-quality, fixed-income debt instruments with maturities corresponding to the expected timing of benefit payments as of the annual measurement date for each of the various plans. Effective in 2016, the Company began to measure the service cost and interest cost components of pension expense 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. The Company has accounted for this as a change in accounting estimate and, accordingly has accounted for it on a prospective basis. This change does not affect the measurement of the total benefit obligation. The rate is used to discount the future cash flows of benefit obligations back to the measurement date. This rate will change from year-to-year based on market conditions that affect corporate bond yields. A higher discount rate decreases the present value of the benefit obligations and results in lower pension expense. A 50 bp increase/decrease in the discount rate decreases/increases pension expense by approximately \$33 per year.

The expected rate of return on plan assets represents an estimate of the average rate of return to be earned by plan assets over the period that the benefits included in the benefit obligation are to be paid. The expected return on plan assets assumption is based on a weighted average of estimated long-term returns of major asset classes and the historical performance of plan assets. In determining estimated asset class returns, we take into account historical and future expected long-term returns and the value of active management, as well as the interest rate environment. Asset allocation is determined based on long-term return, volatility and correlation characteristics of the asset classes, the profiles of the plans' liabilities, and acceptable levels of risk. Lower returns on the plan assets result in higher pension expense. A 50 bp increase/decrease in the estimated rate of return on plan assets decreases/increases pension expense by approximately \$19 per year.

We use a market-related valuation method for recognizing certain investment gains or losses for our significant pension plans. Investment gains or losses are the difference between the expected return and actual return on plan assets. The expected return on plan assets is determined based on a market-related value of plan assets. For equities, this is a calculated value that recognizes investment gains and losses in fair value related to equities over a five-year period from the year in which they occur and reduces year-to-year volatility. The market-related value for fixed income investments equals the actual fair value. Expense in future periods will be impacted as gains or losses are recognized in the market-related value of assets.

The expected rate of compensation increase is another key assumption. We determine this rate based on review of the underlying long-term salary increase trend characteristic of labor markets and historical experience, as well as comparison to peer companies. A 50 bp increase/decrease in the expected rate of compensation increases/decreases pension expense by approximately \$16 per year.

### **Loss Contingencies**

In the normal course of business we encounter contingencies, i.e., situations involving varying degrees of uncertainty as to the outcome and effect on us. We accrue a liability for loss contingencies when it is considered probable that a liability has been incurred and the amount of loss can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within

## **Table of Contents**

this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued.

Contingencies include those associated with litigation and environmental matters, for which our accounting policy is discussed in Note 1, Major Accounting Policies, to the consolidated financial statements, and particulars are provided in Note 17, Commitments and Contingencies, to the consolidated financial statements. Significant judgment is required in both determining probability and whether the amount of loss associated with a contingency can be reasonably estimated. These determinations are made based on the best available information at the time. As additional information becomes available, we reassess probability and estimates of loss contingencies. Revisions in the estimates associated with loss contingencies could have a significant impact on our results of operations in the period in which an accrual for loss contingencies is recorded or adjusted. For example, due to the inherent uncertainties related to environmental exposures, a significant increase to environmental liabilities could occur if a new site is designated, the scope of remediation is increased, or our proportionate share is increased. Similarly, a future charge for regulatory fines or damage awards associated with litigation could have a significant impact on our net income in the period in which it is recorded.

## **NEW ACCOUNTING GUIDANCE**

As of the first quarter of fiscal year 2016, we adopted guidance on the presentation of deferred income taxes that resulted in all deferred tax liabilities and assets being classified as noncurrent on the balance sheet. Accordingly, prior year amounts were reclassified to conform to the current year presentation. The guidance, which did not change the existing requirement to net deferred tax assets and liabilities within a jurisdiction, resulted in a reclassification adjustment that increased noncurrent deferred tax assets by \$13.7 and decreased noncurrent deferred tax liabilities by \$99.9 as of 30 September 2015.

See Note 2, New Accounting Guidance, to the consolidated financial statements for information concerning the implementation and impact of new accounting guidance.

## **FORWARD-LOOKING STATEMENTS**

This Management's Discussion and Analysis contains forward-looking statements within the safe harbor provisions of the Private Securities Litigation Reform Act of 1995, including statements about business outlook. These forward-looking statements are based on management's reasonable expectations and assumptions as of the date of this report. Actual performance and financial results may differ materially from projections and estimates expressed in the forward-looking statements because of many factors not anticipated by management, including, without limitation, global or regional economic conditions and supply and demand dynamics in market segments into which the Company sells; significant fluctuations in interest rates and foreign currencies from that currently anticipated; future financial and operating performance of major customers; unanticipated contract terminations or customer cancellations or postponement of projects and sales; asset impairments due to economic conditions or specific customer or other events; the impact of competitive products and pricing; ability to protect and enforce the Company's intellectual property rights; unexpected changes in raw material supply and markets; the impact of price fluctuations in natural gas and disruptions in markets and the economy due to oil price volatility; the ability to recover increased energy and raw material costs from customers; costs and outcomes of litigation or regulatory investigations; the success of productivity and cost reduction programs; the timing, impact, and other uncertainties of future acquisitions or divestitures; political risks, including the risks of unanticipated government actions; acts of war or terrorism; the impact of changes in environmental, tax or other legislation and regulatory activities in jurisdictions in which the Company and its affiliates operate; and other risk factors described in Section 1A, Risk Factors. The Company disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statements contained in this document to reflect any change in the Company's assumptions, beliefs or expectations or any change

in events, conditions, or circumstances upon which any such forward-looking statements are based.

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

Our earnings, cash flows, and financial position are exposed to market risks relating to fluctuations in interest rates and foreign currency exchange rates. It is our policy to minimize our cash flow exposure to adverse changes in currency exchange rates and to manage the financial risks inherent in funding with debt capital.

We address these financial exposures through a controlled program of risk management that includes the use of derivative financial instruments. We have established counterparty credit guidelines and generally enter into

---

**Table of Contents**

transactions with financial institutions of investment grade or better, thereby minimizing the risk of credit loss. All instruments are entered into for other than trading purposes. For details on the types and use of these derivative instruments and the major accounting policies, see Note 1, Major Accounting Policies, and Note 13, Financial Instruments, to the consolidated financial statements, for additional information. Additionally, we mitigate adverse energy price impacts through our cost pass-through contracts with customers and price increases.

Our derivative and other financial instruments consist of long-term debt (including current portion), interest rate swaps, cross currency interest rate swaps, and foreign exchange-forward contracts. The net market value of these financial instruments combined is referred to below as the net financial instrument position and is disclosed in Note 14, Fair Value Measurements, to the consolidated financial statements.

At 30 September 2016 and 2015, the net financial instrument position was a liability of \$5,187.7 and \$4,452.0, respectively. The increase in the net financial instrument position was primarily due to the issuance of long-term debt by Versum, which included senior unsecured notes (\$425.0) and a fully drawn term loan facility (\$575.0).

The analysis below presents the sensitivity of the market value of our financial instruments to selected changes in market rates and prices. Market values are the present value of projected future cash flows based on the market rates and prices chosen. The market values for interest rate risk and foreign currency risk are calculated by us using a third-party software model that utilizes standard pricing models to determine the present value of the instruments based on market conditions (interest rates, spot and forward exchange rates, and implied volatilities) as of the valuation date.

**Interest Rate Risk**

Our debt portfolio as of 30 September 2016, including the effect of currency swap agreements, primarily comprised debt denominated in U.S. dollars (37%) and Euros (33%). This debt portfolio is composed of 53% fixed-rate debt and 47% variable-rate debt. Changes in interest rates have different impacts on the fixed- and variable-rate portions of our debt portfolio. A change in interest rates on the fixed portion of the debt portfolio impacts the net financial instrument position but has no impact on interest incurred or cash flows. A change in interest rates on the variable portion of the debt portfolio impacts the interest incurred and cash flows but does not impact the net financial instrument position.

The sensitivity analysis related to the interest rate risk on the fixed portion of our debt portfolio assumes an instantaneous 100 bp move in interest rates from the level at 30 September 2016, with all other variables held constant. A 100 bp increase in market interest rates would result in a decrease of \$161 and \$139 in the net liability position of financial instruments at 30 September 2016 and 2015, respectively. A 100 bp decrease in market interest rates would result in an increase of \$178 and \$151 in the net liability position of financial instruments at 30 September 2016 and 2015, respectively.

Based on the variable-rate debt included in our debt portfolio, including the interest rate swap agreements, a 100 bp increase in interest rates would result in an additional \$29 and \$30 of interest incurred per year at the end of 30 September 2016 and 2015, respectively. A 100 bp decline in interest rates would lower interest incurred by \$29 and \$30 per year at 30 September 2016 and 2015, respectively.

**Foreign Currency Exchange Rate Risk**

The sensitivity analysis related to foreign currency exchange rates assumes an instantaneous 10% change in the foreign currency exchange rates from their levels at 30 September 2016 and 2015, with all other variables held constant. A 10% strengthening or weakening of the functional currency of an entity versus all other currencies would

result in a decrease or increase, respectively, of \$438 and \$421 in the net liability position of financial instruments at 30 September 2016 and 2015, respectively.

The primary currency pairs for which we have exchange rate exposure are Euros and U.S. dollars and British Pound Sterling and U.S. dollars. Foreign currency debt, cross currency interest rate swaps, and foreign exchange-forward contracts are used in countries where we do business, thereby reducing our net asset exposure. Foreign exchange-forward contracts and cross currency interest rate swaps are also used to hedge our firm and highly anticipated foreign currency cash flows. Thus, there is either an asset/liability or cash flow exposure related to all of the financial instruments in the above sensitivity analysis for which the impact of a movement in exchange rates would be in the opposite direction and materially equal to the impact on the instruments in the analysis.



**Table of Contents**

The majority of the Company's sales are derived from outside of the United States and denominated in foreign currencies. Financial results therefore will be affected by changes in foreign currency rates. The Euro and the Chinese Renminbi represent the largest exposures in terms of our foreign earnings. We estimate that a 10% reduction in either the Euro or the Chinese Renminbi versus the U.S. dollar would lower our annual operating income by approximately \$20 and \$15, respectively.

---

**Table of Contents**

**ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA  
MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING**

Air Products' management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting, which is defined in the following sentences, is a process designed to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles and includes those policies and procedures that:

- (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- (ii) provide reasonable assurance that the transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. 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
- (iii) 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 inherent limitations, internal control over financial reporting can only provide reasonable assurance and may not prevent or detect misstatements. Further, because of changes in conditions, the effectiveness of our internal control over financial reporting may vary over time. Our processes contain self-monitoring mechanisms, and actions are taken to correct deficiencies as they are identified.

Management has evaluated the effectiveness of its internal control over financial reporting based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, management concluded that, as of 30 September 2016, the Company's internal control over financial reporting was effective.

KPMG LLP, an independent registered public accounting firm, has issued their opinion on the Company's internal control over financial reporting as of 30 September 2016 as stated in their report which appears herein.

/s/ Seifi Ghasemi  
Seifi Ghasemi  
Chairman, President, and  
Chief Executive Officer  
21 November 2016

/s/ M. Scott Crocco  
M. Scott Crocco  
Executive Vice President and  
Chief Financial Officer  
21 November 2016

**Table of Contents**

**REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

The Board of Directors and Shareholders of Air Products and Chemicals, Inc.:

We have audited the accompanying consolidated balance sheets of Air Products and Chemicals, Inc. and Subsidiaries (the Company) as of 30 September 2016 and 2015, and the related consolidated income statements, consolidated comprehensive income statements, consolidated statements of cash flows, and equity for each of the years in the three-year period ended 30 September 2016. In connection with our audits of the consolidated financial statements, we also have audited the financial statement schedule referred to in Item 15(a)(2) in this Form 10-K. We have audited the Company's internal control over financial reporting as of 30 September 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. The Company's management is responsible for these consolidated financial statements and financial statement schedule, 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 these consolidated financial statements and financial statement schedule and an opinion on the Company's internal control over financial reporting 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 audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the consolidated financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Air Products and Chemicals, Inc. and Subsidiaries as of 30 September 2016 and 2015, and the

results of their operations and their cash flows for each of the years in the three-year period ended 30 September 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. Also in our opinion, Air Products and Chemicals, Inc. and Subsidiaries maintained, in all material respects, effective internal control over financial reporting as of 30 September 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

/s/ KPMG LLP

Philadelphia, Pennsylvania

21 November 2016

**Table of Contents****The Consolidated Financial Statements**

Air Products and Chemicals, Inc. and Subsidiaries

**CONSOLIDATED INCOME STATEMENTS**

Year ended 30 September (Millions of dollars, except for share data)	2016	2015	2014
<b>Sales</b>	<b>\$9,524.4</b>	\$9,894.9	\$10,439.0
Cost of sales	<b>6,402.7</b>	6,939.0	7,629.9
Selling and administrative	<b>849.3</b>	939.3	1,054.7
Research and development	<b>132.0</b>	137.1	139.8
Business separation costs	<b>52.2</b>	7.5	
Business restructuring and cost reduction actions	<b>33.9</b>	207.7	12.7
Pension settlement loss	<b>6.4</b>	21.2	5.5
Goodwill and intangible asset impairment charge			310.1
Gain on previously held equity interest		17.9	
Other income (expense), net	<b>58.1</b>	47.3	52.8
<b>Operating Income</b>	<b>2,106.0</b>	1,708.3	1,339.1
Equity affiliates income	<b>148.6</b>	154.5	151.4
Interest expense	<b>115.5</b>	103.5	125.1
Loss on extinguishment of debt	<b>6.9</b>	16.6	
<b>Income From Continuing Operations Before Taxes</b>	<b>2,132.2</b>	1,742.7	1,365.4
Income tax provision	<b>586.5</b>	418.3	369.4
<b>Income From Continuing Operations</b>	<b>1,545.7</b>	1,324.4	996.0
<b>Loss from Discontinued Operations, net of tax</b>	<b>(884.2)</b>	(6.8)	(2.9)
<b>Net Income</b>	<b>661.5</b>	1,317.6	993.1
<b>Less: Net Income Attributable to Noncontrolling Interests</b>	<b>30.4</b>	39.7	1.4
<b>Net Income Attributable to Air Products</b>	<b>\$631.1</b>	\$1,277.9	\$991.7
<b>Net Income Attributable to Air Products</b>			
Income from continuing operations	<b>\$1,515.3</b>	\$1,284.7	\$994.6
Loss from discontinued operations	<b>(884.2)</b>	(6.8)	(2.9)
<b>Net Income Attributable to Air Products</b>	<b>\$631.1</b>	\$1,277.9	\$991.7
<b>Basic Earnings Per Common Share Attributable to Air Products</b>			
Income from continuing operations	<b>\$7.00</b>	\$5.98	\$4.68
Loss from discontinued operations	<b>(4.08)</b>	(.03)	(.02)
<b>Net Income Attributable to Air Products</b>	<b>\$2.92</b>	\$5.95	\$4.66
<b>Diluted Earnings Per Common Share Attributable to Air Products</b>			
Income from continuing operations	<b>\$6.94</b>	\$5.91	\$4.62
Loss from discontinued operations	<b>(4.05)</b>	(.03)	(.01)
<b>Net Income Attributable to Air Products</b>	<b>\$2.89</b>	\$5.88	\$4.61
<b>Weighted Average Common Shares Basic (in millions)</b>	<b>216.4</b>	214.9	212.7
<b>Weighted Average Common Shares Diluted (in millions)</b>	<b>218.3</b>	217.3	215.2

The accompanying notes are an integral part of these statements.



**Table of Contents**

Air Products and Chemicals, Inc. and Subsidiaries

**CONSOLIDATED COMPREHENSIVE INCOME STATEMENTS**

Year ended 30 September (Millions of dollars)	2016	2015	2014
<b>Net Income</b>	<b>\$661.5</b>	<b>\$1,317.6</b>	<b>\$993.1</b>
<b>Other Comprehensive Loss, net of tax:</b>			
Translation adjustments, net of tax of (\$19.8), \$45.2, and \$36.5	9.9	(699.3)	(213.1)
Net gain (loss) on derivatives, net of tax of \$9.1, (\$16.0), and (\$13.6)	13.7	(35.0)	(15.2)
Pension and postretirement benefits, net of tax of (\$157.4), (\$148.5), and (\$28.0)	(335.1)	(278.5)	(74.2)
Reclassification adjustments:			
Currency translation adjustment	2.7		
Derivatives, net of tax of (\$9.4), \$7.0, and (\$1.9)	(36.0)	20.8	(9.1)
Pension and postretirement benefits, net of tax of \$43.0, \$47.7, and \$40.0	87.2	97.0	84.7
<b>Total Other Comprehensive Loss</b>	<b>(257.6)</b>	<b>(895.0)</b>	<b>(226.9)</b>
<b>Comprehensive Income</b>	<b>403.9</b>	<b>422.6</b>	<b>766.2</b>
<b>Net Income Attributable to Noncontrolling Interests</b>	<b>30.4</b>	<b>39.7</b>	<b>1.4</b>
<b>Other Comprehensive Income (Loss) Attributable to Noncontrolling Interests</b>	<b>4.8</b>	<b>(11.0)</b>	<b>(5.6)</b>
<b>Comprehensive Income Attributable to Air Products</b>	<b>\$368.7</b>	<b>\$393.9</b>	<b>\$770.4</b>

The accompanying notes are an integral part of these statements.

**Table of Contents**

Air Products and Chemicals, Inc. and Subsidiaries

**CONSOLIDATED BALANCE SHEETS**

30 September (Millions of dollars, except for share data)	2016	2015
<b>Assets</b>		
<b>Current Assets</b>		
Cash and cash items	\$1,501.3	\$206.4
Trade receivables, net	1,439.9	1,406.2
Inventories	619.9	657.8
Contracts in progress, less progress billings	81.6	110.8
Prepaid expenses	99.6	67.0
Other receivables and current assets	555.6	343.5
Current assets of discontinued operations	19.4	1.8
<b>Total Current Assets</b>	<b>4,317.3</b>	<b>2,793.5</b>
Investment in net assets of and advances to equity affiliates	1,288.1	1,265.7
Plant and equipment, net	8,852.7	8,745.1
Goodwill, net	1,150.2	1,131.3
Intangible assets, net	488.0	508.3
Noncurrent capital lease receivables	1,221.7	1,350.2
Other noncurrent assets	737.3	648.6
Noncurrent assets of discontinued operations		891.8
<b>Total Noncurrent Assets</b>	<b>13,738.0</b>	<b>14,541.0</b>
<b>Total Assets</b>	<b>\$18,055.3</b>	<b>\$17,334.5</b>
<b>Liabilities and Equity</b>		
<b>Current Liabilities</b>		
Payables and accrued liabilities	\$1,810.6	\$1,641.7
Accrued income taxes	146.6	55.8
Short-term borrowings	935.8	1,494.3
Current portion of long-term debt	371.3	435.6
Current liabilities of discontinued operations	19.0	17.0
<b>Total Current Liabilities</b>	<b>3,283.3</b>	<b>3,644.4</b>
Long-term debt	4,918.1	3,949.1
Other noncurrent liabilities	1,873.4	1,554.0
Deferred income taxes	767.1	803.4
Noncurrent liabilities of discontinued operations		2.5
<b>Total Noncurrent Liabilities</b>	<b>7,558.6</b>	<b>6,309.0</b>
<b>Total Liabilities</b>	<b>10,841.9</b>	<b>9,953.4</b>
<b>Commitments and Contingencies</b> See Note 17		
<b>Air Products Shareholders' Equity</b>		
Common stock (par value \$1 per share; issued 2016 and 2015 249,455,584 shares)	249.4	249.4
Capital in excess of par value	970.0	904.7
Retained earnings	10,475.5	10,580.4
Accumulated other comprehensive loss	(2,388.3)	(2,125.9)
Treasury stock, at cost (2016 32,104,759 shares; 2015 34,096,471 shares)	(2,227.0)	(2,359.6)



<b>Total Air Products Shareholders Equity</b>	<b>7,079.6</b>	7,249.0
<b>Noncontrolling Interests</b>	<b>133.8</b>	132.1
<b>Total Equity</b>	<b>7,213.4</b>	7,381.1
<b>Total Liabilities and Equity</b>	<b>\$18,055.3</b>	\$17,334.5

The accompanying notes are an integral part of these statements.

**Table of Contents**

Air Products and Chemicals, Inc. and Subsidiaries

**CONSOLIDATED STATEMENTS OF CASH FLOWS**

Year ended 30 September (Millions of dollars)	2016	2015	2014
<b>Operating Activities</b>			
Net Income	\$661.5	\$1,317.6	\$993.1
Less: Net income attributable to noncontrolling interests	30.4	39.7	1.4
Net income attributable to Air Products	631.1	1,277.9	991.7
Loss from discontinued operations	884.2	6.8	2.9
Income from continuing operations attributable to Air Products	1,515.3	1,284.7	994.6
Adjustments to reconcile income to cash provided by operating activities:			
Depreciation and amortization	925.9	936.4	956.9
Deferred income taxes	62.9	2.9	125.5
Loss on extinguishment of debt	6.9	16.6	
Gain on previously held equity interest		(17.9)	
Undistributed earnings of unconsolidated affiliates	(51.8)	(102.6)	(76.0)
(Gain) Loss on sale of assets and investments	(10.0)	(30.1)	4.3
Share-based compensation	37.6	45.7	44.0
Noncurrent capital lease receivables	85.5	(9.5)	20.0
Goodwill and intangible asset impairment charge			310.1
Write-down of long-lived assets associated with restructuring		47.4	
Other adjustments	155.2	48.1	60.7
Working capital changes that provided (used) cash, excluding effects of acquisitions and divestitures:			
Trade receivables	(61.7)	(29.7)	(2.7)
Inventories	32.9	8.3	(23.5)
Contracts in progress, less progress billings	21.3	36.4	(5.6)
Other receivables	(12.2)	57.6	(33.0)
Payables and accrued liabilities	57.0	156.2	(237.9)
Other working capital	(57.4)	(4.1)	52.7
<b>Cash Provided by Operating Activities</b>	<b>2,707.4</b>	<b>2,446.4</b>	<b>2,190.1</b>
<b>Investing Activities</b>			
Additions to plant and equipment	(1,055.8)	(1,265.6)	(1,362.7)
Acquisitions, less cash acquired		(34.5)	
Investment in and advances to unconsolidated affiliates		(4.3)	2.0
Proceeds from sale of assets and investments	85.5	55.3	45.6
Other investing activities	(1.7)	(1.4)	(1.4)
<b>Cash Used for Investing Activities</b>	<b>(972.0)</b>	<b>(1,250.5)</b>	<b>(1,316.5)</b>
<b>Financing Activities</b>			
Long-term debt proceeds	960.4	340.3	463.4
Payments on long-term debt	(485.0)	(708.7)	(608.6)
Net (decrease) increase in commercial paper and short-term borrowings	(144.2)	284.0	148.7
Debt issuance costs	(11.7)	(2.2)	(2.4)
Dividends paid to shareholders	(721.2)	(677.5)	(627.7)

Proceeds from stock option exercises	<b>141.3</b>	121.3	141.6
Excess tax benefit from share-based compensation	<b>33.2</b>	31.9	28.3
Payment for subsidiary shares to noncontrolling interests		(278.4)	(.5)
Other financing activities	<b>(43.9)</b>	(56.1)	(47.1)
<b>Cash Used for Financing Activities</b>	<b>(271.1)</b>	(945.4)	(504.3)
<b>Discontinued Operations</b>			
Cash used for operating activities	<b>(79.9)</b>	(8.6)	(3.0)
Cash used for investing activities	<b>(97.0)</b>	(349.2)	(311.7)
Cash used for financing activities			(157.1)
<b>Cash Used for Discontinued Operations</b>	<b>(176.9)</b>	(357.8)	(471.8)
<b>Effect of Exchange Rate Changes on Cash</b>	<b>7.5</b>	(22.9)	(11.3)
Increase (Decrease) in Cash and Cash Items	<b>1,294.9</b>	(130.2)	(113.8)
Cash and Cash Items Beginning of Year	<b>206.4</b>	336.6	450.4
<b>Cash and Cash Items End of Period</b>	<b>\$1,501.3</b>	\$206.4	\$336.6

The accompanying notes are an integral part of these statements.

**Table of Contents**

Air Products and Chemicals, Inc. and Subsidiaries

**CONSOLIDATED STATEMENTS OF EQUITY**

Year ended 30 September (Millions of dollars)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Loss	Treasury Stock	Air Products Shareholders Equity	Non- controlling Interests	Total Equity
<b>Balance</b>								
<b>30 September 2013</b>	<b>\$249.4</b>	<b>\$799.2</b>	<b>\$9,646.4</b>	<b>\$(1,020.6)</b>	<b>\$(2,632.3)</b>	<b>\$7,042.1</b>	<b>\$156.8</b>	<b>\$7,198.9</b>
Net income			991.7			991.7	28.8	1,020.5
Other comprehensive loss				(221.3)		(221.3)	(5.6)	(226.9)
Cash dividends (\$3.02 per share)			(641.8)			(641.8)		(641.8)
Share-based compensation expense		44.0				44.0		44.0
Issuance of treasury shares for stock option and award plans		(30.0)			155.4	125.4		125.4
Tax benefit of stock option and award plans		29.3				29.3		29.3
Dividends to noncontrolling interests							(24.4)	(24.4)
Purchase of noncontrolling interests		(.5)				(.5)		(.5)
Other			(3.1)			(3.1)		(3.1)
<b>Balance</b>								
<b>30 September 2014</b>	<b>\$249.4</b>	<b>\$842.0</b>	<b>\$9,993.2</b>	<b>\$(1,241.9)</b>	<b>\$(2,476.9)</b>	<b>\$7,365.8</b>	<b>\$155.6</b>	<b>\$7,521.4</b>
Net income			1,277.9			1,277.9	28.2	1,306.1
Other comprehensive loss				(884.0)		(884.0)	(11.0)	(895.0)
Cash dividends (\$3.20 per share)			(687.9)			(687.9)		(687.9)
Share-based compensation expense		43.7				43.7		43.7
Issuance of treasury shares for stock option and award plans		(15.1)			117.3	102.2		102.2

Tax benefit of stock option and award plans		32.0				32.0		32.0
Dividends to noncontrolling interests							(38.0)	(38.0)
Purchase of noncontrolling interests		(.3)				(.3)	(.2)	(.5)
Other		2.4	(2.8)			(.4)	(2.5)	(2.9)
<b>Balance</b>								
<b>30 September 2015</b>	<b>\$249.4</b>	<b>\$904.7</b>	<b>\$10,580.4</b>	<b>\$(2,125.9)</b>	<b>\$(2,359.6)</b>	<b>\$7,249.0</b>	<b>\$132.1</b>	<b>\$7,381.1</b>
Net income			631.1			631.1	30.4	661.5
Other comprehensive income (loss)				(262.4)		(262.4)	4.8	(257.6)
Cash dividends (\$3.39 per share)			(733.7)			(733.7)		(733.7)
Share-based compensation expense		37.6				37.6		37.6
Issuance of treasury shares for stock option and award plans		(5.5)			132.6	127.1		127.1
Tax benefit of stock option and award plans		33.2				33.2		33.2
Dividends to noncontrolling interests							(33.6)	(33.6)
Other			(2.3)			(2.3)	.1	(2.2)
<b>Balance</b>								
<b>30 September 2016</b>	<b>\$249.4</b>	<b>\$970.0</b>	<b>\$10,475.5</b>	<b>\$(2,388.3)</b>	<b>\$(2,227.0)</b>	<b>\$7,079.6</b>	<b>\$133.8</b>	<b>\$7,213.4</b>

The accompanying notes are an integral part of these statements.

**Table of Contents****NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS**

(Millions of dollars, except for share data)

1. <u>Major Accounting Policies</u>	65
2. <u>New Accounting Guidance</u>	71
3. <u>Materials Technologies Separation</u>	72
4. <u>Discontinued Operations</u>	73
5. <u>Business Restructuring and Cost Reduction Actions</u>	75
6. <u>Business Combination</u>	76
7. <u>Inventories</u>	76
8. <u>Summarized Financial Information of Equity Affiliates</u>	77
9. <u>Plant and Equipment, net</u>	78
10. <u>Goodwill</u>	78
11. <u>Intangible Assets</u>	79
12. <u>Leases</u>	80
13. <u>Financial Instruments</u>	81
14. <u>Fair Value Measurements</u>	84
15. <u>Debt</u>	86
16. <u>Retirement Benefits</u>	88
17. <u>Commitments and Contingencies</u>	96
18. <u>Capital Stock</u>	99
19. <u>Share-Based Compensation</u>	100
20. <u>Accumulated Other Comprehensive Loss</u>	103
21. <u>Noncontrolling Interests</u>	103
22. <u>Earnings per Share</u>	104
23. <u>Income Taxes</u>	105
24. <u>Supplemental Information</u>	108
25. <u>Summary by Quarter (Unaudited)</u>	110
26. <u>Business Segment and Geographic Information</u>	112

**1. MAJOR ACCOUNTING POLICIES****Basis of Presentation and Consolidation Principles**

The accompanying consolidated financial statements of Air Products and Chemicals, Inc. were prepared in accordance with accounting principles generally accepted in the United States of America ( U.S. GAAP ) and include the accounts of Air Products and Chemicals, Inc. and those of its controlled subsidiaries ( we, our, us, the Company, Air Products or registrant ), which are generally majority owned. Intercompany transactions and balances are eliminated in consolidation.

We consolidate all entities that we control. The general condition for control is ownership of a majority of the voting interests of an entity. Control may also exist in arrangements where we are the primary beneficiary of a variable interest entity (VIE). An entity that has both the power to direct the activities that most significantly impact the economic performance of a VIE and the obligation to absorb the losses or receive the benefits significant to the VIE is considered the primary beneficiary of that entity. We have determined that we are not a primary beneficiary in any material VIE.

Certain prior year information has been reclassified to conform to the 2016 presentation.

### **Estimates and Assumptions**

The preparation of the financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

### **Revenue Recognition**

Revenue from product sales is recognized as risk and title to the product transfer to the customer (which generally occurs at the time shipment is made), the sales price is fixed or determinable, and collectability is reasonably assured. Sales returns and allowances are not a business practice in the industry.

## **Table of Contents**

Revenue from equipment sale contracts is recorded primarily using the percentage-of-completion method. Under this method, revenue from the sale of major equipment, such as liquefied natural gas (LNG) heat exchangers and large air separation units, is recognized based on labor hours or costs incurred to date compared with total estimated labor hours or costs to be incurred. When adjustments in estimated total contract revenues or estimated total costs or labor hours are required, any changes in the estimated profit from prior estimates are recognized in the current period for the inception-to-date effect of such change. Changes in estimates on projects accounted for under the percentage-of-completion method favorably impacted operating income by approximately \$20 in fiscal year 2016, primarily during the fourth quarter. Our changes in estimates would not have significantly impacted amounts recorded in prior years. Changes in estimates during fiscal years 2015 and 2014 were not significant.

Certain contracts associated with facilities that are built to provide product to a specific customer are required to be accounted for as leases. In cases where operating lease treatment is necessary, there is no difference in revenue recognition over the life of the contract as compared to accounting for the contract as product sales. In cases where capital lease treatment is necessary, the timing of revenue and expense recognition is impacted. Revenue and expense are recognized up front for the sale of equipment component of the contract as compared to revenue recognition over the life of the arrangement under contracts not qualifying as capital leases. Additionally, a portion of the revenue representing interest income from the financing component of the lease receivable is reflected as sales over the life of the contract. Allowances for credit losses associated with capital lease receivables are recorded using the specific identification method. As of 30 September 2016 and 2015, the credit quality of capital lease receivables did not require an allowance for credit losses.

If an arrangement involves multiple deliverables, the delivered items are considered separate units of accounting if the items have value on a stand-alone basis. Revenues are allocated to each deliverable based upon relative selling prices derived from company specific evidence.

Amounts billed for shipping and handling fees are classified as sales in the consolidated income statements.

Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue-producing transactions are presented on a net basis and excluded from sales in the consolidated income statements. We record a liability until remitted to the respective taxing authority.

## **Cost of Sales**

Cost of sales predominantly represents the cost of tangible products sold. These costs include labor, raw materials, plant engineering, power, depreciation, production supplies and materials packaging costs, and maintenance costs. Costs incurred for shipping and handling are also included in cost of sales.

## **Depreciation**

Depreciation is recorded using the straight-line method, which deducts equal amounts of the cost of each asset from earnings every year over its expected economic useful life. The principal lives for major classes of plant and equipment are summarized in Note 9, Plant and Equipment, net.

## **Selling and Administrative**

The principal components of selling and administrative expenses are compensation, advertising, and promotional costs.



### **Postemployment Benefits**

We provide termination benefits to employees as part of ongoing benefit arrangements and record a liability for termination benefits when probable and estimable. These criteria are met when management, with the appropriate level of authority, approves and commits to its plan of action for termination; the plan identifies the employees to be terminated and their related benefits; and the plan is to be completed within one year. We do not provide one-time benefit arrangements of significance.

### **Fair Value Measurements**

We are required to measure certain assets and liabilities at fair value, either upon initial measurement or for subsequent accounting or reporting. For example, fair value is used in the initial measurement of net assets acquired in a business combination; on a recurring basis in the measurement of derivative financial instruments; and on a nonrecurring basis when long-lived assets are written down to fair value when held for sale or determined to be impaired. Refer to Note 14, Fair Value Measurements, for information on the methods and assumptions used in our fair value measurements.

## **Table of Contents**

### **Financial Instruments**

We address certain financial exposures through a controlled program of risk management that includes the use of derivative financial instruments. The types of derivative financial instruments permitted for such risk management programs are specified in policies set by management. Refer to Note 13, Financial Instruments, for further detail on the types and use of derivative instruments into which we enter.

Major financial institutions are counterparties to all of these derivative contracts. We have established counterparty credit guidelines and generally enter into transactions with financial institutions of investment grade or better. Management believes the risk of incurring losses related to credit risk is remote, and any losses would be immaterial to the consolidated financial results, financial condition, or liquidity.

We recognize derivatives on the balance sheet at fair value. On the date the derivative instrument is entered into, we generally designate the derivative as either (1) a hedge of a forecasted transaction or of the variability of cash flows to be received or paid related to a recognized asset or liability (cash flow hedge), (2) a hedge of a net investment in a foreign operation (net investment hedge), or (3) a hedge of the fair value of a recognized asset or liability (fair value hedge).

The following details the accounting treatment of our cash flow, fair value, net investment, and non-designated hedges:

Changes in the fair value of a derivative that is designated as and meets the cash flow hedge criteria are recorded in Accumulated other comprehensive loss (AOCL) to the extent effective and then recognized in earnings when the hedged items affect earnings.

Changes in the fair value of a derivative that is designated as and meets all the required criteria for a fair value hedge, along with the gain or loss on the hedged asset or liability that is attributable to the hedged risk, are recorded in current period earnings.

Changes in the fair value of a derivative and foreign currency debt that are designated as and meet all the required criteria for a hedge of a net investment are recorded as translation adjustments in AOCL.

Changes in the fair value of a derivative that is not designated as a hedge are recorded immediately in earnings. We formally document the relationships between hedging instruments and hedged items, as well as our risk management objective and strategy for undertaking various hedge transactions. This process includes relating derivatives that are designated as fair value or cash flow hedges to specific assets and liabilities on the balance sheet or to specific firm commitments or forecasted transactions. We also formally assess, at the inception of the hedge and on an ongoing basis, whether derivatives are highly effective in offsetting changes in fair values or cash flows of the hedged item. If it is determined that a derivative is not highly effective as a hedge, or if a derivative ceases to be a highly effective hedge, we will discontinue hedge accounting with respect to that derivative prospectively.

### **Foreign Currency**

Since we do business in many foreign countries, fluctuations in currency exchange rates affect our financial position and results of operations.

In most of our foreign operations, the local currency is considered the functional currency. Foreign subsidiaries translate their assets and liabilities into U.S. dollars at current exchange rates in effect at the end of the fiscal period. The gains or losses that result from this process are shown as translation adjustments in AOCI in the equity section of the balance sheet.

The revenue and expense accounts of foreign subsidiaries are translated into U.S. dollars at the average exchange rates that prevail during the period. Therefore, the U.S. dollar value of these items on the income statement fluctuates from period to period, depending on the value of the dollar against foreign currencies. Some transactions are made in currencies different from an entity's functional currency. Gains and losses from these foreign currency transactions are generally included in other income (expense), net on our consolidated income statements as they occur.

### **Environmental Expenditures**

Accruals for environmental loss contingencies are recorded when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Remediation costs are capitalized if the costs improve the

## **Table of Contents**

Company's property as compared with the condition of the property when originally constructed or acquired, or if the costs prevent environmental contamination from future operations. We expense environmental costs related to existing conditions resulting from past or current operations and from which no current or future benefit is discernible. The amounts charged to income from continuing operations related to environmental matters totaled \$27.0 in fiscal 2016, \$28.3 in 2015, and \$35.1 in 2014.

The measurement of environmental liabilities is based on an evaluation of currently available information with respect to each individual site and considers factors such as existing technology, presently enacted laws and regulations, and prior experience in remediation of contaminated sites. An environmental liability related to cleanup of a contaminated site might include, for example, a provision for one or more of the following types of costs: site investigation and testing costs, cleanup costs, costs related to soil and water contamination resulting from tank ruptures, post-remediation monitoring costs, and outside legal fees. These liabilities include costs related to other potentially responsible parties to the extent that we have reason to believe such parties will not fully pay their proportionate share. They do not take into account any claims for recoveries from insurance or other parties and are not discounted.

As assessments and remediation progress at individual sites, the amount of projected cost is reviewed, and the liability is adjusted to reflect additional technical and legal information that becomes available. Management has an established process in place to identify and monitor the Company's environmental exposures. An environmental accrual analysis is prepared and maintained that lists all environmental loss contingencies, even where an accrual has not been established. This analysis assists in monitoring the Company's overall environmental exposure and serves as a tool to facilitate ongoing communication among the Company's technical experts, environmental managers, environmental lawyers, and financial management to ensure that required accruals are recorded and potential exposures disclosed.

Given inherent uncertainties in evaluating environmental exposures, actual costs to be incurred at identified sites in future periods may vary from the estimates. Refer to Note 17, Commitments and Contingencies, for additional information on the Company's environmental loss contingencies.

The accruals for environmental liabilities are reflected in the consolidated balance sheets, primarily as part of other noncurrent liabilities.

## **Litigation**

In the normal course of business, we are involved in legal proceedings. We accrue a liability for such matters when it is probable that a liability has been incurred and the amount can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued. The accrual for a litigation loss contingency includes estimates of potential damages and other directly related costs expected to be incurred. Refer to Note 17, Commitments and Contingencies, for additional information on our current legal proceedings.

## **Share-Based Compensation**

We have various share-based compensation programs, which include deferred stock units, stock options, and restricted stock. We expense the grant-date fair value of these awards over the vesting period during which employees perform related services. Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement. We utilize a Black Scholes model to value stock option awards. The grant-date fair value of the deferred stock units tied to a market condition is estimated using a Monte

Carlo simulation model.

### **Income Taxes**

We account for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the tax effects of temporary differences between the financial reporting and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. A principal temporary difference results from the excess of tax depreciation over book depreciation because accelerated methods of depreciation and shorter useful lives are used for income tax purposes. The cumulative impact of a change in tax rates or regulations is included in income tax expense in the period that includes the enactment date. We recognize deferred tax assets net of existing valuation allowance to the extent we believe that these assets are more likely than not to be realized considering all available evidence.

## **Table of Contents**

A tax benefit for an uncertain tax position is recognized when it is more likely than not that the position will be sustained upon examination based on its technical merits. This position is measured as the largest amount of tax benefit that is greater than 50% likely of being realized. Interest and penalties related to unrecognized tax benefits are recognized as a component of income tax expense. For additional information regarding our income taxes, refer to Note 23, Income Taxes.

## **Cash and Cash Items**

Cash and cash items include cash, time deposits, and certificates of deposit acquired with an original maturity of three months or less.

## **Trade Receivables, net**

Trade receivables comprise amounts owed to us through our operating activities and are presented net of allowances for doubtful accounts. The allowances for doubtful accounts represent estimated uncollectible receivables associated with potential customer defaults on contractual obligations. A provision for customer defaults is made on a general formula basis when it is determined that the risk of some default is probable and estimable but cannot yet be associated with specific customers. The assessment of the likelihood of customer defaults is based on various factors, including the length of time the receivables are past due, historical experience, and existing economic conditions. The allowance also includes amounts for certain customers where a risk of default has been specifically identified, considering factors such as the financial condition of the customer and customer disputes over contractual terms and conditions. Allowance for doubtful accounts were \$56.8 and \$48.5 as of fiscal year end 30 September 2016 and 2015, respectively. Provisions to the allowance for doubtful accounts charged against income were \$22.8, \$26.3 and \$16.4 in 2016, 2015, and 2014, respectively.

## **Inventories**

Inventories are stated at the lower of cost or market. We write down our inventories for estimated obsolescence or unmarketable inventory based upon assumptions about future demand and market conditions.

We utilize the last-in, first-out (LIFO) method for determining the cost of inventories in the United States for the Industrial Gases and the Materials Technologies segments. Inventories for these segments outside of the United States are accounted for on the first-in, first-out (FIFO) method, as the LIFO method is not generally permitted in the foreign jurisdictions where these segments operate. The inventories of the Industrial Gases – Global and the Corporate and other segments on a worldwide basis, as well as all other inventories, are accounted for on the FIFO basis.

At the business segment level, inventories are recorded at FIFO and the LIFO pool adjustments are not allocated to the business segments.

## **Equity Investments**

The equity method of accounting is used when we exercise significant influence but do not have operating control, generally assumed to be 20% – 50% ownership. Under the equity method, original investments are recorded at cost and adjusted by our share of undistributed earnings or losses of these companies. Equity investments are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be recoverable.

## **Plant and Equipment**

Plant and equipment is stated at cost less accumulated depreciation. Construction costs, labor, and applicable overhead related to installations are capitalized. Expenditures for additions and improvements that extend the lives or increase the capacity of plant assets are capitalized. The costs of maintenance and repairs of plant and equipment are charged to expense as incurred.

Fully depreciated assets are retained in the gross plant and equipment and accumulated depreciation accounts until they are removed from service. In the case of disposals, assets and related depreciation are removed from the accounts, and the net amounts, less proceeds from disposal, are included in income. Refer to Note 9, Plant and Equipment, net, for further detail.

### **Computer Software**

We capitalize costs incurred to purchase or develop software for internal use. Capitalized costs include purchased computer software packages, payments to vendors/consultants for development and implementation or modification to a purchased package to meet our requirements, payroll and related costs for employees directly

## **Table of Contents**

involved in development, and interest incurred while software is being developed. Capitalized computer software costs are included in the balance sheet classification plant and equipment, net and depreciated over the estimated useful life of the software, generally a period of three to ten years.

### **Capitalized Interest**

As we build new plant and equipment, we include in the cost of these assets a portion of the interest payments we make during the year. The amount of capitalized interest was \$32.9, \$49.1, and \$33.0 in 2016, 2015, and 2014, respectively.

### **Impairment of Long-Lived Assets**

Long-lived assets are grouped for impairment testing at the lowest level for which there are identifiable cash flows that are largely independent of the cash flows of other assets and liabilities and are evaluated for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset group may not be recoverable. We assess recoverability by comparing the carrying amount of the asset group to estimated undiscounted future cash flows expected to be generated by the asset group. If an asset group is considered impaired, the impairment loss to be recognized is measured as the amount by which the asset group's carrying amount exceeds its fair value. Long-lived assets to be sold are reported at the lower of carrying amount or fair value less cost to sell.

### **Asset Retirement Obligations**

The fair value of a liability for an asset retirement obligation is recognized in the period in which it is incurred. The fair value of the liability is measured using discounted estimated cash flows and is adjusted to its present value in subsequent periods as accretion expense is recorded. The corresponding asset retirement costs are capitalized as part of the carrying amount of the related long-lived asset and depreciated over the asset's useful life. Our asset retirement obligations are primarily associated with Industrial Gases on-site long-term supply contracts, under which we have built a facility on land owned by the customer and are obligated to remove the facility at the end of the contract term. Our asset retirement obligations totaled \$119.9 and \$109.4 at 30 September 2016 and 2015, respectively.

### **Goodwill**

Business combinations are accounted for using the acquisition method. The purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair market values. Any excess purchase price over the fair market value of the net assets acquired, including identified intangibles, is recorded as goodwill. Preliminary purchase price allocations are made at the date of acquisition and finalized when information needed to affirm underlying estimates is obtained, within a maximum allocation period of one year.

Goodwill is subject to impairment testing at least annually. In addition, goodwill is tested more frequently if a change in circumstances or the occurrence of events indicates that potential impairment exists. Refer to Note 10, Goodwill, for further detail.

### **Intangible Assets**

Intangible assets with determinable lives primarily consist of customer relationships, purchased patents and technology, and land use rights. The cost of intangible assets with determinable lives is amortized on a straight-line basis over the estimated period of economic benefit. No residual value is estimated for these intangible assets. Indefinite-lived intangible assets consist of trade names and trademarks. Indefinite-lived intangibles are subject to



impairment testing at least annually. In addition, intangible assets are tested more frequently if a change in circumstances or the occurrence of events indicates that potential impairment exists.

Customer relationships are generally amortized over periods of five to twenty-five years. Purchased patents and technology and other are generally amortized over periods of five to twenty years. Land use rights, which are included in other intangibles, are generally amortized over a period of fifty years. Amortizable lives are adjusted whenever there is a change in the estimated period of economic benefit. Refer to Note 11, Intangible Assets, for further detail.

### **Retirement Benefits**

The cost of pension benefits is recognized over the employees' service period. We are required to use actuarial methods and assumptions in the valuation of defined benefit obligations and the determination of expense. Differences between actual and expected results or changes in the value of obligations and plan assets are not recognized in earnings as they occur but, rather, systematically and gradually over subsequent periods. Refer to Note 16, Retirement Benefits, for disclosures related to our pension and other postretirement benefits.

---

**Table of Contents****2. NEW ACCOUNTING GUIDANCE*****Accounting Guidance Implemented in 2016*****Balance Sheet Classification of Deferred Taxes**

In November 2015, the Financial Accounting Standards Board (FASB) issued guidance to simplify the presentation of deferred income taxes by requiring that all deferred tax liabilities and assets be classified as noncurrent on the balance sheet. As of the first quarter of fiscal year 2016, we adopted this guidance on a retrospective basis. Accordingly, prior year amounts have been reclassified to conform to the current year presentation. The guidance, which did not change the existing requirement to net deferred tax assets and liabilities within a jurisdiction, resulted in a reclassification adjustment that increased noncurrent deferred tax assets by \$13.7 and decreased noncurrent deferred tax liabilities by \$99.9 as of 30 September 2015.

**Discontinued Operations**

In April 2014, the FASB issued an update to change the criteria for determining which disposals qualify as a discontinued operation and to expand related disclosure requirements. Under the new guidance, a disposal is required to be reported in discontinued operations if the disposal represents a strategic shift that has or will have a major effect on operations and financial results. We adopted this guidance prospectively for new disposals and new disposal groups classified as held for sale beginning in the first quarter of fiscal year 2016. This guidance had no impact on our consolidated financial statements upon adoption. As a result of actions taken during the second quarter of 2016, our Energy-from-Waste segment has been reported as a discontinued operation. Refer to Note 4, Discontinued Operations, for additional information.

***New Accounting Guidance to be Implemented*****Revenue Recognition**

In May 2014, the FASB issued guidance based on the principle that revenue is recognized in an amount expected to be collected and to which the entity expects to be entitled in exchange for the transfer of goods or services. As originally issued, this guidance was effective for us beginning in fiscal year 2018. In August 2015, the FASB deferred the effective date by one year while providing the option to early adopt the standard on the original effective date. Accordingly, we will have the option to adopt the standard in either fiscal year 2018 or 2019. The guidance can be adopted either retrospectively or as a cumulative-effect adjustment as of the date of adoption.

We are in the initial stages of evaluating the adoption alternatives allowed by the new standard and the impact the standard is expected to have on our consolidated financial statements. As the new standard will supersede substantially all existing revenue guidance affecting us under U.S. GAAP, it could impact the timing of revenue and cost recognition across all of our business segments, in addition to our business processes and our information technology systems. As a result, our evaluation of the effect of the new standard will extend over future periods.

**Consolidation Analysis**

In February 2015, the FASB issued an update to amend current consolidation guidance. The guidance impacts the analysis an entity must perform in determining if it should consolidate certain legal entities such as limited partnerships, limited liability corporations, and securitization structures. The guidance is effective beginning fiscal year 2017, with early adoption permitted. The guidance may be applied retrospectively or using a modified

retrospective approach by recording a cumulative-effect adjustment to equity as of the beginning of the fiscal year of adoption. This guidance will not have a significant impact on our consolidated financial statements.

### **Debt Issuance Costs**

In April 2015, the FASB issued guidance requiring that debt issuance costs related to a recognized debt liability be presented in the balance sheet as a direct deduction from the carrying amount of the debt instead of as a separate deferred asset. In August 2015, the FASB issued an update to incorporate the U.S. Securities and Exchange Commission (SEC) Staff guidance which allows debt issuance costs associated with a line-of-credit arrangement to be presented as a deferred asset that is subsequently amortized over the term of the arrangement, regardless of whether there are any outstanding borrowings. This change in accounting principle will be adopted retrospectively beginning in fiscal year 2017. This guidance will not have a significant impact on our consolidated financial statements.

---

**Table of Contents****Leases**

In February 2016, the FASB issued guidance which requires lessees to recognize a right-of-use asset and lease liability on the balance sheet for all leases, including operating leases, with a term in excess of 12 months. The guidance also expands the quantitative and qualitative disclosure requirements. The guidance is effective in fiscal year 2020, with early adoption permitted, and must be applied using a modified retrospective approach. We are currently evaluating the impact of adopting this new guidance on the consolidated financial statements, and we have started the assessment process by evaluating the population of leases under the revised definition of what qualifies as a leased asset. The Company is the lessee under various agreements for real estate, distribution equipment, aircraft, and vehicles that are currently accounted for as operating leases as discussed in Note 12, Leases. The new guidance requires the lessee to record operating leases on the balance sheet with a right-of-use asset and corresponding liability for future payment obligations.

**Share-Based Compensation**

In March 2016, the FASB issued an update to simplify the accounting for employee share-based payments, including the income tax impacts, the classification on the statement of cash flows, and forfeitures. The amendments are effective for fiscal year 2018, with early adoption permitted. We continue to evaluate the impact of this guidance on our consolidated financial statements and the timing of adoption. Upon adoption, we currently anticipate a greater degree of volatility in the income tax provision and effective income tax rate as a result of the new guidance, which requires excess tax benefits and deficiencies to be recognized in the income statement rather than in additional paid-in capital on the balance sheet.

**Derivative Contract Novations**

In March 2016, the FASB issued guidance to clarify that a change in the counterparty to a derivative instrument that has been designated as a hedging instrument does not, in and of itself, require re-designation of that hedging relationship provided that all other hedge accounting criteria continue to be met. This guidance is effective in fiscal year 2018, with early adoption permitted. We do not expect adoption of this guidance to have a significant impact on our consolidated financial statements.

**Credit Losses on Financial Instruments**

In June 2016, the FASB issued an update on the measurement of credit losses, which requires measurement and recognition of expected credit losses for financial assets, including trade receivables and capital lease receivables, held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. The method to determine a loss is different from the existing guidance, which requires a credit loss to be recognized when it is probable. The guidance is effective beginning fiscal year 2021, with early adoption permitted beginning fiscal year 2020. We are currently evaluating the impact this update will have on our consolidated financial statements.

**Cash Flow Statement Classification**

In August 2016, the FASB issued guidance to reduce diversity in practice on how certain cash receipts and cash payments are classified in the statement of cash flows. The guidance is effective beginning fiscal year 2019, with early adoption permitted, and should be applied retrospectively. We are currently evaluating the impact of adopting this new guidance on the consolidated financial statements.

**3. MATERIALS TECHNOLOGIES SEPARATION**

On 16 September 2015, the Company announced plans to separate its Materials Technologies business, which contains two divisions, Electronic Materials (EMD) and Performance Materials (PMD), into an independent publicly traded company and distribute to Air Products shareholders all of the shares of the new public company in a tax-free distribution (a spin-off). Versum Materials, Inc., or Versum, was formed as the new company to hold the Materials Technologies business subject to spin-off. On 6 May 2016, the Company entered into an agreement to sell certain subsidiaries and assets comprising the PMD division to Evonik Industries AG for \$3.8 billion in cash and the assumption of certain liabilities. As a result, the Company moved forward with the planned spin-off of Versum containing only the EMD division.

As further discussed below, Air Products completed the separation of its EMD division through the spin-off of Versum on 1 October 2016. As a result, the historical results of the EMD division will be presented as a

**Table of Contents**

discontinued operation beginning in fiscal year 2017. The historical results of the PMD division will be reflected as a discontinued operation when it becomes probable for the sale to occur and actions required to meet the plan of sale indicate that it is unlikely that significant changes will occur. The PMD division is not classified as held for sale due to certain conditions of the sale, including regulatory and anti-trust requirements. We continue to evaluate the progress of the sale of the PMD division to determine when it should be presented as a discontinued operation.

In fiscal year 2016, we incurred separation costs of \$52.2 (\$48.3 after-tax, or \$.22 per share), primarily related to legal, advisory, and indirect tax costs associated with these transactions. The costs are reflected on the consolidated income statements as Business separation costs. A significant portion of these costs were not tax deductible because they were directly related to the plan for the tax-free spin-off of Versum. Our income tax provision includes additional tax expense related to the separation of \$51.8 (\$.24 per share), of which \$45.7 resulted from a dividend declared during the third quarter of 2016 to repatriate \$443.8 from a subsidiary in South Korea to the U.S. due to the intended separation of the EMD division from the industrial gases business in South Korea. Previously, most of these foreign earnings were considered to be indefinitely reinvested.

On 30 September 2016, in anticipation of the spin-off, Versum entered into certain financing transactions to allow for a cash distribution of \$550.0 and a distribution in-kind of notes issued by Versum with an aggregate principal amount of \$425.0 to Air Products. Air Products then exchanged these notes with certain financial institutions for \$418.3 of Air Products outstanding commercial paper. The exchange resulted in a loss of \$6.9 (\$4.3 after-tax, or \$.02 per share) and has been reflected on the consolidated income statements as Loss on extinguishment of debt. This loss is deductible for tax purposes. This non-cash exchange was excluded from the consolidated statements of cash flows. Refer to Note 15, Debt, for additional information on the Versum financing.

**Subsequent Event**

On 1 October 2016 (the distribution date), Air Products completed the spin-off of Versum into a separate and independent public company by way of a distribution to the Air Products stockholders of all of the then issued and outstanding shares of common stock of Versum on the basis of one share of Versum common stock for every two shares of Air Products common stock held as of the close of business on 21 September 2016 (the record date for the distribution). Fractional shares of Versum common stock were not distributed to Air Products common stockholders. Air Products stockholders received cash in lieu of fractional shares. As a result of the distribution, Versum Materials, Inc. is now an independent public company and its common stock is listed under the symbol VSM on the New York Stock Exchange.

**4. DISCONTINUED OPERATIONS*****Energy-from-Waste (EfW)***

On 29 March 2016, the Board of Directors approved the Company's exit of its EfW business. As a result, efforts to start up and operate the two EfW projects located in Tees Valley, United Kingdom, have been discontinued. The decision to exit the business and stop development of the projects was based on continued difficulties encountered and the Company's conclusion, based on testing and analysis completed during the second quarter of fiscal year 2016, that significant additional time and resources would be required to make the projects operational. The EfW segment is presented as a discontinued operation. Prior year EfW business segment information has been reclassified to conform to current year presentation.

During the second quarter of fiscal year 2016, we recorded a loss of \$945.7 (\$846.6 after-tax) for the disposal of the business. Income tax benefits related only to one of the projects, as the other did not qualify for a local tax deduction.

This loss included \$913.5 to write down plant assets, previously recorded as construction in progress, to their estimated net realizable value of \$20.0 and \$32.2 to record a liability for plant disposition and other costs. We estimated the net realizable value of the projects as of 31 March 2016 assuming an orderly liquidation of assets capable of being marketed on a secondary equipment market based on market quotes and our experience with selling similar equipment. An asset's orderly liquidation value is the amount that could be realized from a liquidation sale, given a reasonable period of time to find a buyer, selling the asset in the existing condition where it is located, and assuming the highest and best use of the asset by market participants. There have been no significant changes in the estimated net realizable value as of 30 September 2016. A valuation allowance of \$58.0 and unrecognized tax benefits of \$7.9 were recorded relating to deferred tax assets on capital assets generated from the loss.

**Table of Contents**

The following table summarizes the carrying amount of the accrual for our actions to dispose of the EfW business at 30 September 2016, which is included in current liabilities of discontinued operations:

	Asset Impairment	Contract Actions/Other	Total
Loss on disposal of business	\$913.5	\$32.2	\$945.7
Noncash expenses	(913.5)		(913.5)
Cash expenditures		(18.6)	(18.6)
Currency translation adjustment		(1.4)	(1.4)
<b>30 September 2016</b>	<b>\$</b>	<b>\$12.2</b>	<b>\$12.2</b>

The results of EfW discontinued operations are summarized below:

	2016	2015	2014
Loss before taxes	<b>\$(41.0)</b>	\$ (9.2)	\$ (10.9)
Income tax provision	<b>3.4</b>	2.4	3.4
Loss from operations of discontinued operations	<b>(37.6)</b>	(6.8)	(7.5)
Loss on disposal, net of tax	<b>(846.6)</b>		
<b>Loss from Discontinued Operations, net of tax</b>	<b>\$ (884.2)</b>	\$ (6.8)	\$ (7.5)

The loss from operations of EfW discontinued operations primarily relates to land lease costs, commercial and administrative costs, and cost incurred for ongoing project exit activities.

Assets and liabilities of the EfW discontinued operations consist of the following:

	30 September 2016	30 September 2015
Plant and equipment	<b>\$18.2</b>	\$
Other current assets	<b>1.2</b>	1.8
<b>Total Current Assets</b>	<b>\$19.4</b>	\$1.8
Plant and equipment	\$	\$891.8
<b>Total Noncurrent Assets</b>	<b>\$</b>	<b>\$891.8</b>
Payables and accrued liabilities	<b>\$19.0</b>	\$17.0
<b>Total Current Liabilities</b>	<b>\$19.0</b>	\$17.0
Other noncurrent liabilities	\$	\$2.5
<b>Total Noncurrent Liabilities</b>	<b>\$</b>	<b>\$2.5</b>

**Homecare**

In 2012, the Board of Directors authorized the sale of our Homecare business. We sold the majority of our Homecare business to The Linde Group in 2012. In 2014, a gain of \$3.9 was recognized for the sale of the remaining Homecare business, which was primarily in the United Kingdom and Ireland, and the settlement of contingencies related to the 2012 sale to The Linde Group.



The results of the Homecare discontinued operations are summarized below:

	<b>2016</b>	2015	2014
Sales	\$	\$	\$8.5
Income before taxes	\$	\$	\$.7
Income tax provision			
Income from operations of discontinued operations			.7
Gain on sale of business, net of tax			3.9
<b>Income (Loss) from Discontinued Operations, net of tax</b>	<b>\$</b>	<b>\$</b>	<b>\$4.6</b>

**Table of Contents**

As of 30 September 2016 and 2015, there were no assets or liabilities classified as discontinued operations relating to the Homecare business.

**5. BUSINESS RESTRUCTURING AND COST REDUCTION ACTIONS**

The charges we record for business restructuring and cost reduction actions have been excluded from segment operating income.

**Cost Reduction Actions**

In fiscal year 2016, we recognized an expense of \$33.9 (\$24.0 after-tax, or \$.11 per share) for severance and other benefits related to cost reduction actions which resulted in the elimination of approximately 700 positions. The expenses related primarily to the Industrial Gases Americas and the Industrial Gases EMEA segments.

The following table summarizes the carrying amount of the accrual for cost reduction actions at 30 September 2016:

	Severance and Other Benefits
2016 Charge	\$33.9
Amount reflected in pension liability	(.9)
Cash expenditures	(20.4)
Currency translation adjustment	.3
<b>30 September 2016</b>	<b>\$12.9</b>

**Business Realignment and Reorganization**

On 18 September 2014, we announced plans to reorganize the Company, including realignment of our businesses in new reporting segments and other organizational changes, effective as of 1 October 2014. As a result of this reorganization, we incurred severance and other charges.

In fiscal year 2015, we recognized an expense of \$207.7 (\$153.2 after-tax, or \$.71 per share). Severance and other benefits totaled \$151.9 and related to the elimination of approximately 2,000 positions. Asset and associated contract actions totaled \$55.8 and related primarily to a plant shutdown in the Corporate and other segment and the exit of product lines within the Industrial Gases Global and Materials Technologies segments. The 2015 charges related to the segments as follows: \$31.7 in Industrial Gases Americas, \$52.2 in Industrial Gases EMEA, \$10.3 in Industrial Gases Asia, \$37.0 in Industrial Gases Global, \$27.6 in Materials Technologies, and \$48.9 in Corporate and other.

During the fourth quarter of 2014, an expense of \$12.7 (\$8.2 after-tax, or \$.04 per share) was incurred relating to the elimination of approximately 50 positions. The 2014 charge related to the segments as follows: \$2.9 in Industrial Gases Americas, \$3.1 in Industrial Gases EMEA, \$1.5 in Industrial Gases Asia, \$1.5 in Industrial Gases Global, \$1.6 in Materials Technologies, and \$2.1 in Corporate and other.

**Table of Contents**

The following table summarizes the carrying amount of the accrual for the business realignment and reorganization at 30 September 2016:

	Severance and Other Benefits	Asset Actions/Other	Total
2014 Charge	\$12.7	\$	\$12.7
Cash expenditures	(2.2)		(2.2)
30 September 2014	\$10.5	\$	\$10.5
2015 Charge	151.9	55.8	207.7
Amount reflected in pension liability	(14.0)		(14.0)
Noncash expenses		(47.4)	(47.4)
Cash expenditures	(113.5)	(1.2)	(114.7)
Currency translation adjustment	(.4)		(.4)
30 September 2015	\$34.5	\$7.2	\$41.7
Cash expenditures	(34.1)	(3.8)	(37.9)
Currency translation adjustment	(.4)		(.4)
<b>30 September 2016</b>	<b>\$</b>	<b>\$3.4</b>	<b>\$3.4</b>

**6. BUSINESS COMBINATION**

On 30 December 2014, we acquired our partner's equity ownership interest in a liquefied atmospheric industrial gases production joint venture in North America for \$22.6, which increased our ownership from 50% to 100%. The transaction was accounted for as a business combination, and subsequent to the acquisition, the results are consolidated within our Industrial Gases - Americas segment. The assets acquired, primarily plant and equipment, were recorded at their fair market values as of the acquisition date.

The acquisition date fair value of the previously held equity interest was determined using a discounted cash flow analysis under the income approach. The twelve months ended 30 September 2015 include a gain of \$17.9 (\$11.2 after-tax, or \$.05 per share) as a result of revaluing our previously held equity interest to fair value as of the acquisition date. This gain is reflected on the consolidated income statements as Gain on previously held equity interest.

**7. INVENTORIES**

The components of inventories are as follows:

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Inventories at FIFO cost		
Finished goods	\$456.7	\$494.9
Work in process	38.2	34.4
Raw materials, supplies and other	204.0	229.3
	698.9	758.6
Less: Excess of FIFO cost over LIFO cost	(79.0)	(100.8)
<b>Inventories</b>	<b>\$619.9</b>	<b>\$657.8</b>

Inventories valued using the LIFO method comprised 34.9% and 35.8% of consolidated inventories before LIFO adjustment at 30 September 2016 and 2015, respectively. Liquidation of LIFO inventory layers in 2016, 2015, and 2014 did not materially affect the results of operations.

FIFO cost approximates replacement cost.

**Table of Contents****8. SUMMARIZED FINANCIAL INFORMATION OF EQUITY AFFILIATES**

The summarized financial information below is on a combined 100% basis and has been compiled based on financial statements of the companies accounted for by the equity method. The amounts presented include the accounts of the following equity affiliates:

Abdullah Hashim Industrial Gases & Equipment Co., Ltd. (25%);	INOX Air Products Limited (50%);
Air Products South Africa (Proprietary) Limited (50%);	Jazan Gas Projects Company (25%);
Bangkok Cogeneration Company Limited (49%);	Kulim Industrial Gases Sdn. Bhd. (50%);
Bangkok Industrial Gases Co., Ltd. (49%);	Sapio Produzione Idrogeno Ossigeno S.r.l. (49%);
Chengdu Air & Gas Products Ltd. (50%);	Tecnologia en Nitrogeno S. de R.L. de C.V. (50%);
Helap S.A. (50%);	Tyczka Industrie-Gases GmbH (50%);
High-Tech Gases (Beijing) Co., Ltd. (50%);	WuXi Hi-Tech Gas Co., Ltd. (50%);
INFRA Group (40%);	and principally, other industrial gas producers.

<b>30 September</b>	<b>2016</b>	2015
Current assets	<b>\$1,449.8</b>	\$1,296.4
Noncurrent assets	<b>3,063.9</b>	2,607.4
Current liabilities	<b>699.2</b>	654.0
Noncurrent liabilities	<b>1,540.6</b>	988.0

<b>Year Ended 30 September</b>	<b>2016</b>	2015	2014
Net sales	<b>\$2,308.5</b>	\$2,604.3	\$2,808.7
Sales less cost of sales	<b>882.6</b>	949.2	984.7
Operating income	<b>487.8</b>	524.0	542.9
Net income	<b>338.0</b>	351.0	359.5

On 19 April 2015, a joint venture between Air Products and ACWA Holding entered into a 20-year oxygen and nitrogen supply agreement to supply Saudi Aramco's oil refinery and power plant being built in Jazan, Saudi Arabia. Air Products owns 25% of the joint venture and guarantees the repayment of its share of an equity bridge loan. ACWA also guarantees their share of the loan. As of 30 September 2016 and 2015, other noncurrent liabilities included \$94.4 and \$67.5, respectively, for our obligation to make future equity contributions based on our proportionate share of the advances received by the joint venture under the loan. During 2016 and 2015, we recorded noncash transactions which resulted in an increase of \$26.9 and \$67.5, respectively, to our investment in net assets of and advances to equity affiliates. These noncash transactions have been excluded from the consolidated statements of cash flows. In total, we expect to invest approximately \$100 in this joint venture. We determined that the joint venture is a variable interest entity, for which we are not the primary beneficiary. Air Products has a long-term sale of equipment contract with the joint venture to engineer, procure, and construct the industrial gas facilities that will supply the gases to Saudi Aramco.

In December 2015, we sold our investment in Daido Air Products Electronics, Inc. for \$15.9, which resulted in a gain of \$.7. The carrying value at time of sale included a \$12.8 investment in net assets of and advances to equity affiliates and a \$2.4 foreign currency translation loss that had been deferred in accumulated other comprehensive loss.

In January 2016, we sold our investment in SembCorp Air Products (HyCo) Pte. Ltd. The transaction did not have a material impact on the financial statements.

There have been no other significant changes to our investments in equity affiliates during fiscal year 2016.

Dividends received from equity affiliates were \$96.8, \$51.9, and \$75.4 in 2016, 2015, and 2014, respectively.

The investment in net assets of and advances to equity affiliates as of 30 September 2016 and 2015 included investment in foreign affiliates of \$1,286.0 and \$1,262.8, respectively.

As of 30 September 2016 and 2015, the amount of investment in companies accounted for by the equity method included goodwill in the amount of \$109.5 and \$112.0, respectively.

**Table of Contents****9. PLANT AND EQUIPMENT, NET**

The major classes of plant and equipment are as follows:

<b>30 September</b>	Useful Life in years	<b>2016</b>	2015
Land		<b>\$232.9</b>	\$226.2
Buildings	30	<b>1,119.8</b>	1,080.2
<b>Production facilities</b>			
Industrial Gases Region <sup>(A)</sup>	10 to 20	<b>12,372.1</b>	11,873.8
Materials Technologies	10 to 15	<b>859.2</b>	902.7
Other	5 to 20	<b>36.0</b>	43.0
Total production facilities		<b>13,267.3</b>	12,819.5
Distribution and other machinery and equipment <sup>(B)</sup>	5 to 25	<b>4,042.1</b>	3,963.1
Construction in progress		<b>1,528.0</b>	1,373.8
Plant and equipment, at cost		<b>20,190.1</b>	19,462.8
Less: accumulated depreciation		<b>11,337.4</b>	10,717.7
Plant and equipment, net		<b>\$8,852.7</b>	\$8,745.1

<sup>(A)</sup> Depreciable lives of production facilities related to long-term customer supply contracts are matched to the contract lives.

<sup>(B)</sup> The depreciable lives for various types of distribution equipment are 10 to 25 years for cylinders, depending on the nature and properties of the product; 20 years for tanks; 7.5 years for customer stations; and 5 to 15 years for tractors and trailers.

Depreciation expense was \$893.0, \$900.4, and \$914.8 in 2016, 2015, and 2014, respectively.

**10. GOODWILL**

Changes to the carrying amount of consolidated goodwill by segment are as follows:

	Industrial Gases	Industrial Gases	Industrial Gases	Industrial Gases	Materials Technologies	Total
	Americas	EMEA	Asia	Global		
Goodwill, net at 30 September 2014	\$327.2	\$433.3	\$140.0	\$21.4	\$315.4	\$1,237.3
Acquisitions and adjustments	2.2	3.2				5.4
Currency translation and other	(31.8)	(50.0)	(6.9)	(1.5)	(21.2)	(111.4)
Goodwill, net at 30 September 2015	\$297.6	\$386.5	\$133.1	\$19.9	\$294.2	\$1,131.3
Currency translation and other	11.5	(5.9)	2.1	.3	10.9	18.9
<b>Goodwill, net at 30 September 2016</b>	<b>\$309.1</b>	<b>\$380.6</b>	<b>\$135.2</b>	<b>\$20.2</b>	<b>\$305.1</b>	<b>\$1,150.2</b>

<b>30 September</b>	<b>2016</b>	2015	2014
Goodwill, gross	<b>\$1,408.8</b>	\$1,375.0	\$1,522.1
Accumulated impairment losses <sup>(A)</sup>	<b>(258.6)</b>	(243.7)	(284.8)

<b>Goodwill, net</b>	<b>\$1,150.2</b>	\$1,131.3	\$1,237.3
----------------------	------------------	-----------	-----------

<sup>(A)</sup> Amount is attributable to the Industrial Gases Americas segment and includes currency translation of \$46.6, \$61.5, and \$20.4 as of 30 September 2016, 2015, and 2014, respectively.

We conduct goodwill impairment testing in the fourth quarter of each fiscal year and whenever events and changes in circumstances indicate that the carrying value of goodwill might not be recoverable. Our goodwill impairment test involves a two-step process. In the first step, we estimate the fair value of each reporting unit and compare it to its carrying value. If the fair value of the reporting unit exceeds its carrying value, goodwill is not impaired and no further testing is required. If the fair value of the reporting unit is less than its carrying value, we perform a second step to determine the amount of goodwill impairment loss, if any. In the second step, the reporting unit's fair value is allocated to the assets and liabilities of the reporting unit, including any unrecognized intangible assets, in an analysis that calculates the implied fair value of goodwill in the same manner as if the reporting unit were being acquired in a business combination. If the implied fair value of the reporting unit's goodwill is less than its carrying value, the difference is recorded as a goodwill impairment charge.



**Table of Contents**

In the fourth quarter of 2014, we determined that the fair value of each reporting unit exceeded its carrying value, with the exception of the Latin America reporting unit within the Industrial Gases Americas segment. The Latin America reporting unit is composed predominately of our Indura business with assets and goodwill associated with operations in Chile and other Latin American countries. In 2014, economic conditions in Latin America, including the impact of tax legislation in Chile, became less favorable due to increasing inflation, a decline in Chilean manufacturing growth, and weaker export demand for many commodities. As a result, our growth projections for this reporting unit were lowered and we determined that the associated goodwill was impaired. A noncash goodwill impairment charge of \$305.2 was recorded to write down goodwill to its implied fair value as of 1 July 2014. This impairment is reflected on our consolidated income statements within Goodwill and intangible assets impairment charge. As of 30 September 2016, accumulated impairment losses were \$258.6, due to the currency impacts since the loss was recorded on 1 July 2014.

During the fourth quarter of 2016, we conducted our annual goodwill impairment test. We determined that the fair value of all our reporting units exceeded their carrying value. There were no indications of impairment.

**11. INTANGIBLE ASSETS**

The table below provides details of acquired intangible assets:

	30 September 2016			30 September 2015		
	Gross	Accumulated Amortization/ Impairment	Net	Gross	Accumulated Amortization/ Impairment	Net
Customer relationships	\$517.4	\$(155.2)	\$362.2	\$507.4	\$(129.6)	\$377.8
Patents and technology	76.6	(57.9)	18.7	76.9	(53.3)	23.6
Other	81.7	(37.3)	44.4	81.8	(35.0)	46.8
Total finite-lived intangibles	675.7	(250.4)	425.3	666.1	(217.9)	448.2
Trade names and trademarks, indefinite-lived	66.2	(3.5)	62.7	63.4	(3.3)	60.1
Total Intangible Assets	\$741.9	\$(253.9)	\$488.0	\$729.5	\$(221.2)	\$508.3

The decrease in net intangible assets from 2015 to 2016 is primarily due to amortization. Amortization expense for intangible assets was \$32.9, \$36.0, and \$42.1 in 2016, 2015, and 2014, respectively. Refer to Note 1, Major Accounting Policies, for amortization periods associated with our intangible assets.

In the fourth quarter of 2016, we conducted our annual impairment test of indefinite-lived intangibles and found no indications of impairment.

In the fourth quarter of 2014, we conducted our annual impairment test of indefinite-lived intangibles utilizing the royalty savings method, a form of the income approach. We determined that the carrying value of trade names and trademarks were in excess of their fair value, and as a result, we recorded an impairment charge of \$4.9 to reduce these assets to their fair value. This impairment is reflected within Goodwill and intangible asset impairment charge on our consolidated income statements. These trade names and trademarks are included in our Industrial Gases Americas segment.

Projected annual amortization expense for intangible assets as of 30 September 2016 is as follows:

2017	\$31.2
2018	29.5
2019	27.9
2020	27.5
2021	26.1
Thereafter	283.1
Total	\$425.3

**Table of Contents****12. LEASES****Lessee Accounting**

Capital leases, primarily for the right to use machinery and equipment, are included with owned plant and equipment on the consolidated balance sheet in the amount of \$22.7 and \$12.8 at 30 September 2016 and 2015, respectively. Related amounts of accumulated depreciation are \$4.8 and \$4.3, respectively.

Operating leases principally relate to real estate and also include aircraft, distribution equipment, and vehicles. Certain leases include escalation clauses, renewal, and/or purchase options. Rent expense is recognized on a straight-line basis over the minimum lease term. Rent expense under operating leases, including month-to-month agreements, was \$80.8 in 2016, \$88.2 in 2015, and \$97.9 in 2014.

At 30 September 2016, minimum payments due under leases are as follows:

	Capital Leases	Operating Leases
2017	\$2.0	\$70.5
2018	1.8	62.5
2019	1.6	49.9
2020	1.6	38.4
2021	2.7	31.6
Thereafter	21.3	102.2
<b>Total</b>	<b>\$31.0</b>	<b>\$355.1</b>

The present value of the above future capital lease payments totaled \$10.2. Refer to Note 15, Debt.

In addition to the operating lease payments disclosed above, future minimum payments due under leases related to discontinued operations (i.e., Tees Valley, United Kingdom ) include approximately \$2 in each of the next five years and \$40 thereafter, for a total lease commitment of approximately \$50.

**Lessor Accounting**

As discussed under Revenue Recognition in Note 1, Major Accounting Policies, certain contracts associated with facilities that are built to provide product to a specific customer are required to be accounted for as leases. Lease receivables, net, are primarily included in noncurrent capital lease receivables on our consolidated balance sheets, with the remaining balance in other receivables and current assets.

The components of lease receivables were as follows:

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Gross minimum lease payments receivable	<b>\$2,072.6</b>	\$2,322.5
Unearned interest income	<b>(762.7)</b>	(888.1)
<b>Lease Receivables, net</b>	<b>\$1,309.9</b>	\$1,434.4

Lease payments collected in 2016, 2015, and 2014 were \$186.0, \$148.1, and \$134.4, respectively. These payments reduced the lease receivable balance by \$85.5, \$69.3, and \$72.7 in 2016, 2015, and 2014, respectively.

At 30 September 2016, minimum lease payments expected to be collected are as follows:

2017	\$182.7
2018	181.4
2019	175.9
2020	171.1
2021	165.1
Thereafter	1,196.4
Total	\$2,072.6

**Table of Contents****13. FINANCIAL INSTRUMENTS****Currency Price Risk Management**

Our earnings, cash flows, and financial position are exposed to foreign currency risk from foreign currency denominated transactions and net investments in foreign operations. It is our policy to minimize our cash flow volatility from changes in currency exchange rates. This is accomplished by identifying and evaluating the risk that our cash flows will change in value due to changes in exchange rates and by executing the appropriate strategies necessary to manage such exposures. Our objective is to maintain economically balanced currency risk management strategies that provide adequate downside protection.

**Forward Exchange Contracts**

We enter into forward exchange contracts to reduce the cash flow exposure to foreign currency fluctuations associated with highly anticipated cash flows and certain firm commitments, such as the purchase of plant and equipment. We also enter into forward exchange contracts to hedge the cash flow exposure on intercompany loans. This portfolio of forward exchange contracts consists primarily of Euros and U.S. dollars. The maximum remaining term of any forward exchange contract currently outstanding and designated as a cash flow hedge at 30 September 2016 is 2.8 years.

Forward exchange contracts are also used to hedge the value of investments in certain foreign subsidiaries and affiliates by creating a liability in a currency in which we have a net equity position. The primary currency pairs in this portfolio of forward exchange contracts are Euros and U.S. dollars and British Pound Sterling and U.S. dollars.

In addition to the forward exchange contracts that are designated as hedges, we utilize forward exchange contracts that are not designated as hedges. These contracts are used to economically hedge foreign currency-denominated monetary assets and liabilities, primarily working capital. The primary objective of these forward exchange contracts is to protect the value of foreign currency-denominated monetary assets and liabilities from the effects of volatility in foreign exchange rates that might occur prior to their receipt or settlement. This portfolio of forward exchange contracts consists of many different foreign currency pairs, with a profile that changes from time to time depending on business activity and sourcing decisions.

The table below summarizes our outstanding currency price risk management instruments:

	<b>30 September 2016</b>		30 September 2015	
	<b>US\$</b>	<b>Years</b>	<b>US\$</b>	<b>Years</b>
	<b>Notional</b>	<b>Average Maturity</b>	<b>Notional</b>	<b>Average Maturity</b>
<b>Forward Exchange Contracts</b>				
Cash flow hedges	\$4,130.3	.5	\$4,543.8	.5
Net investment hedges	968.2	2.7	491.3	4.0
Not designated	2,850.5	.4	863.3	.7
<b>Total Forward Exchange Contracts</b>	<b>\$7,949.0</b>	<b>.7</b>	<b>\$5,898.4</b>	<b>.9</b>

The notional value of forward exchange contracts not designated in the table above increased as a result of repayment of certain outstanding intercompany loans prior to their original maturity dates in anticipation of the spin-off of Versum. The forward exchange contracts no longer qualified as cash flow hedges due to the early repayment of the

loans. We entered into additional forward exchange contracts to offset these outstanding positions to eliminate any future earnings impact.

In addition to the above, we use foreign currency-denominated debt to hedge the foreign currency exposures of our net investment in certain foreign subsidiaries. The designated foreign currency denominated debt and related accrued interest included 920.7 million (\$1,034.4) at 30 September 2016 and 687.7 million (\$768.4) at 30 September 2015. The designated foreign currency-denominated debt is located on the balance sheet in the long-term debt and current portion of long-term debt line items.

### **Debt Portfolio Management**

It is our policy to identify on a continuing basis the need for debt capital and evaluate the financial risks inherent in funding the Company with debt capital. Reflecting the result of this ongoing review, the debt portfolio and hedging

**Table of Contents**

program are managed with the objectives and intent to (1) reduce funding risk with respect to borrowings made by us to preserve our access to debt capital and provide debt capital as required for funding and liquidity purposes, and (2) manage the aggregate interest rate risk and the debt portfolio in accordance with certain debt management parameters.

**Interest Rate Management Contracts**

We enter into interest rate swaps to change the fixed/variable interest rate mix of our debt portfolio in order to maintain the percentage of fixed- and variable-rate debt within the parameters set by management. In accordance with these parameters, the agreements are used to manage interest rate risks and costs inherent in our debt portfolio. Our interest rate management portfolio generally consists of fixed-to-floating interest rate swaps (which are designated as fair value hedges), pre-issuance interest rate swaps and treasury locks (which hedge the interest rate risk associated with anticipated fixed-rate debt issuances and are designated as cash flow hedges), and floating-to-fixed interest rate swaps (which are designated as cash flow hedges). At 30 September 2016, the outstanding interest rate swaps were denominated in U.S. dollars. The notional amount of the interest rate swap agreements is equal to or less than the designated debt being hedged. When interest rate swaps are used to hedge variable-rate debt, the indices of the swaps and the debt to which they are designated are the same. It is our policy not to enter into any interest rate management contracts which lever a move in interest rates on a greater than one-to-one basis.

**Cross Currency Interest Rate Swap Contracts**

We enter into cross currency interest rate swap contracts when our risk management function deems necessary. These contracts may entail both the exchange of fixed- and floating-rate interest payments periodically over the life of the agreement and the exchange of one currency for another currency at inception and at a specified future date. These contracts effectively convert the currency denomination of a debt instrument into another currency in which we have a net equity position while changing the interest rate characteristics of the instrument. The contracts are used to hedge either certain net investments in foreign operations or nonfunctional currency cash flows related to intercompany loans. The current cross currency interest rate swap portfolio consists of fixed-to-fixed swaps primarily between U.S. dollars and offshore Chinese Renminbi, U.S. dollars and Chilean Pesos, and U.S. dollars and British Pound Sterling.

The following table summarizes our outstanding interest rate management contracts and cross currency interest rate swaps:

	30 September 2016				30 September 2015			
	US\$ Notional	Pay %	Average Receive %	Years Average Maturity	US\$ Notional	Pay %	Average Receive %	Years Average Maturity
Interest rate swaps (fair value hedge)	\$600.0	LIBOR	2.28%	2.3	\$600.0	LIBOR	2.77%	3.3
Cross currency interest rate swaps (net investment hedge)	\$517.7	3.24%	2.43%	2.6	\$609.9	4.06%	2.61%	3.2
Cross currency interest rate swaps (cash flow hedge)	\$1,088.9	4.77%	2.72%	3.3	\$1,055.2	4.29%	2.63%	3.9
Cross currency interest rate swaps (not designated)	\$27.4	3.62%	.81%	1.8	\$12.9	3.12%	3.08%	4.1





**Table of Contents**

The table below summarizes the fair value and balance sheet location of our outstanding derivatives:

	Balance Sheet Location	30 September		Balance Sheet Location	30 September	
		2016	2015		2016	2015
<b>Derivatives Designated as Hedging Instruments:</b>						
Forward exchange contracts	Other receivables	\$72.3	\$52.1	Accrued liabilities	\$44.0	\$110.7
Interest rate management contracts	Other receivables	19.9	17.6	Accrued liabilities		
	Other noncurrent assets	44.4	68.5	Other noncurrent liabilities	9.1	9.2
Forward exchange contracts	Other noncurrent assets	160.0	153.4	Other noncurrent liabilities	12.0	.8
Interest rate management contracts						
<b>Total Derivatives Designated as Hedging Instruments</b>		<b>\$296.6</b>	<b>\$291.6</b>		<b>\$65.1</b>	<b>\$120.7</b>
<b>Derivatives Not Designated as Hedging Instruments:</b>						
Forward exchange contracts	Other receivables	\$78.7	\$3.2	Accrued liabilities	\$30.0	\$3.9
	Other noncurrent assets		23.3	Other noncurrent liabilities		.6
Forward exchange contracts	Other noncurrent assets		.8	Other noncurrent liabilities	.7	
Interest rate management contracts						
<b>Total Derivatives Not Designated as Hedging Instruments</b>		<b>\$78.7</b>	<b>\$27.3</b>		<b>\$30.7</b>	<b>\$4.5</b>
<b>Total Derivatives</b>		<b>\$375.3</b>	<b>\$318.9</b>		<b>\$95.8</b>	<b>\$125.2</b>

Refer to Note 14, Fair Value Measurements, which defines fair value, describes the method for measuring fair value, and provides additional disclosures regarding fair value measurements.

The table below summarizes the gain or loss related to our cash flow hedges, fair value hedges, net investment hedges, and derivatives not designated as hedging instruments:

	Year Ended 30 September							
	Forward Exchange Contracts		Foreign Currency Debt		Other <sup>(A)</sup>		Total	
	2016	2015	2016	2015	2016	2015	2016	2015
<b>Cash Flow Hedges, net of tax:</b>								
Net gain (loss) recognized in OCI (effective portion)	\$10.5	\$(44.9)	\$	\$	\$3.2	\$9.9	\$13.7	\$(35.0)
Net (gain) loss reclassified from OCI to sales/cost of sales (effective portion)	.2	.6					.2	.6

Net (gain) loss reclassified from OCI to other income (expense), net (effective portion)	(25.7)	35.6			(20.3)	(20.2)	(46.0)	15.4
Net (gain) loss reclassified from OCI to interest expense (effective portion)	6.7	.7			3.3	2.6	10.0	3.3
Net (gain) loss reclassified from OCI to other income (expense), net (ineffective portion)	(.2)	1.5					(.2)	1.5
<b>Fair Value Hedges:</b>								
Net gain (loss) recognized in interest expense <sup>(B)</sup>	\$	\$	\$	\$	\$(8.8)	\$9.9	\$(8.8)	\$9.9
<b>Net Investment Hedges, net of tax:</b>								
Net gain (loss) recognized in OCI	\$17.4	\$60.1	\$(9.6)	\$91.4	\$35.0	\$49.5	\$42.8	\$201.0
<b>Derivatives Not Designated as Hedging Instruments:</b>								
Net gain (loss) recognized in other income (expense), net <sup>(C)</sup>	\$(.8)	\$(7.3)	\$	\$	\$(1.6)	\$.6	\$(2.4)	\$(6.7)

(A) Other includes the impact on other comprehensive income (OCI) and earnings primarily related to interest rate and cross currency interest rate swaps.

(B) The impact of fair value hedges noted above was largely offset by recognized gains and losses resulting from the impact of changes in related interest rates on outstanding debt.

(C) The impact of the non-designated hedges noted above was largely offset by recognized gains and losses resulting from the impact of changes in exchange rates on assets and liabilities denominated in nonfunctional currencies.

## **Table of Contents**

The amount of cash flow hedges' unrealized gains and losses at 30 September 2016 that are expected to be reclassified to earnings in the next twelve months is not material.

The cash flows related to all derivative contracts are reported in the operating activities section of the consolidated statements of cash flows.

## **Credit Risk-Related Contingent Features**

Certain derivative instruments are executed under agreements that require us to maintain a minimum credit rating with both Standard & Poor's and Moody's. If our credit rating falls below this threshold, the counterparty to the derivative instruments has the right to request full collateralization on the derivatives' net liability position. The net liability position of derivatives with credit risk-related contingent features was \$11.2 as of 30 September 2016 and \$.2 as of 30 September 2015. Because our current credit rating is above the various pre-established thresholds, no collateral has been posted on these liability positions.

## **Counterparty Credit Risk Management**

We execute financial derivative transactions with counterparties that are highly rated financial institutions, all of which are investment grade at this time. Some of our underlying derivative agreements give us the right to require the institution to post collateral if its credit rating falls below the pre-established thresholds with Standard & Poor's or Moody's. The collateral that the counterparties would be required to post was \$267.6 as of 30 September 2016 and \$226.9 as of 30 September 2015. No financial institution is required to post collateral at this time, as all have credit ratings at or above the threshold.

## **14. FAIR VALUE MEASUREMENTS**

Fair value is defined as an exit price, i.e., the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

The fair value hierarchy prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

- Level 1 Quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2 Inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the asset or liability.
- Level 3 Inputs that are unobservable for the asset or liability based on our own assumptions (about the assumptions market participants would use in pricing the asset or liability).

The methods and assumptions used to measure the fair value of financial instruments are as follows:

### **Derivatives**

The fair value of our interest rate management contracts and forward exchange contracts are quantified using the income approach and are based on estimates using standard pricing models. These models take into account the value of future cash flows as of the balance sheet date, discounted to a present value using discount factors that match both

the time to maturity and currency of the underlying instruments. The computation of the fair values of these instruments is generally performed by the Company. These standard pricing models utilize inputs which are derived from or corroborated by observable market data such as interest rate yield curves and currency spot and forward rates. Therefore, the fair value of our derivatives is classified as a level 2 measurement. On an ongoing basis, we randomly test a subset of our valuations against valuations received from the transaction's counterparty to validate the accuracy of our standard pricing models. Counterparties to these derivative contracts are highly rated financial institutions.

Refer to Note 13, Financial Instruments, for a description of derivative instruments, including details on the balance sheet line classifications.

### **Long-term Debt**

The fair value of our debt is based on estimates using standard pricing models that take into account the value of future cash flows as of the balance sheet date, discounted to a present value using discount factors that match

**Table of Contents**

both the time to maturity and currency of the underlying instruments. These standard valuation models utilize observable market data such as interest rate yield curves and currency spot rates. Therefore, the fair value of our debt is classified as a level 2 measurement. We generally perform the computation of the fair value of these instruments.

The carrying values and fair values of financial instruments were as follows:

	30 September 2016		30 September 2015	
	Carrying Value	Fair Value	Carrying Value	Fair Value
<b>Assets</b>				
Derivatives				
Forward exchange contracts	\$195.4	\$195.4	\$147.1	\$147.1
Interest rate management contracts	179.9	179.9	171.8	171.8
<b>Liabilities</b>				
Derivatives				
Forward exchange contracts	\$83.1	\$83.1	\$124.4	\$124.4
Interest rate management contracts	12.7	12.7	.8	.8
Long-term debt, including current portion	5,289.4	5,467.2	4,384.7	4,645.7

The carrying amounts reported in the balance sheet for cash and cash items, trade receivables, payables and accrued liabilities, accrued income taxes, and short-term borrowings approximate fair value due to the short-term nature of these instruments. Accordingly, these items have been excluded from the above table.

The following table summarizes assets and liabilities measured at fair value on a recurring basis in the consolidated balance sheets:

	30 September 2016				30 September 2015			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
<b>Assets at Fair Value</b>								
Derivatives								
Forward exchange contracts	\$195.4	\$	\$195.4	\$	\$147.1	\$	\$147.1	\$
Interest rate management contracts	179.9		179.9		171.8		171.8	
<b>Total Assets at Fair Value</b>	<b>\$375.3</b>	<b>\$</b>	<b>\$375.3</b>	<b>\$</b>	<b>\$318.9</b>	<b>\$</b>	<b>\$318.9</b>	<b>\$</b>
<b>Liabilities at Fair Value</b>								
Derivatives								
Forward exchange contracts	\$83.1	\$	\$83.1	\$	\$124.4	\$	\$124.4	\$
Interest rate management contracts	12.7		12.7		.8		.8	
<b>Total Liabilities at Fair Value</b>	<b>\$95.8</b>	<b>\$</b>	<b>\$95.8</b>	<b>\$</b>	<b>\$125.2</b>	<b>\$</b>	<b>\$125.2</b>	<b>\$</b>

The following is a tabular presentation of nonrecurring fair value measurements along with the level within the fair value hierarchy in which the fair value measurement in its entirety falls:

		31 March 2016				2016 Loss
		Total	Level 1	Level 2	Level 3	
Plant and Equipment	Discontinued operations <sup>(A)</sup>	\$20.0	\$	\$	\$20.0	\$913.5

- (A) As a result of our exit from the Energy-from-Waste business, we assessed the recoverability of assets capable of being marketed on a secondary equipment market using an orderly liquidation valuation resulting in an impairment loss for the difference between the orderly liquidation value and net book value of the assets as of 31 March 2016. There have been no significant changes in the estimated net realizable value as of 30 September 2016. For additional information, see Note 4, Discontinued Operations.

**Table of Contents****15. DEBT**

The tables below summarize our outstanding debt at 30 September 2016 and 2015:

**Total Debt**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Short-term borrowings	<b>\$935.8</b>	\$1,494.3
Current portion of long-term debt	<b>371.3</b>	435.6
Long-term debt	<b>4,918.1</b>	3,949.1
<b>Total Debt</b>	<b>\$6,225.2</b>	\$5,879.0

**Short-term Borrowings**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Bank obligations	<b>\$133.1</b>	\$234.3
Commercial paper	<b>802.7</b>	1,260.0
<b>Total Short-term Borrowings</b>	<b>\$935.8</b>	\$1,494.3

The weighted average interest rate of short-term borrowings outstanding at 30 September 2016 and 2015 was 1.1% and .8%, respectively.

Cash paid for interest, net of amounts capitalized, was \$121.1 in 2016, \$97.5 in 2015, and \$132.4 in 2014.

**Table of Contents****Long-term Debt**

	Fiscal Year Maturities	2016	2015
<b>30 September</b>			
<b>Payable in U.S. Dollars</b>			
<b>Debentures</b>			
8.75%	2021	<b>\$18.4</b>	\$18.4
<b>Medium-term Notes</b> (weighted average rate)			
Series D 7.3%	2016		32.1
Series E 7.6%	2026	<b>17.2</b>	17.2
<b>Senior Notes</b>			
Note 2.0%	2016		350.0
Note 1.2%	2018	<b>400.0</b>	400.0
Note 4.375%	2019	<b>400.0</b>	400.0
Note 3.0%	2022	<b>400.0</b>	400.0
Note 2.75%	2023	<b>400.0</b>	400.0
Note 3.35%	2024	<b>400.0</b>	400.0
<b>Versum Financing</b>			
Senior Note 5.5%	2024	<b>425.0</b>	
Term Loan B 3.346%	2023	<b>575.0</b>	
<b>Other</b> (weighted average rate)			
Variable-rate industrial revenue bonds .68%	2035 to 2050	<b>769.9</b>	769.9
Other 1.3%	2018 to 2019	<b>25.7</b>	35.0
<b>Payable in Other Currencies</b>			
Eurobonds 4.625%	2017	<b>337.0</b>	335.2
Eurobonds 2.0%	2020	<b>337.0</b>	335.2
Eurobonds 1.0%	2025	<b>337.0</b>	335.2
Eurobonds .375%	2021	<b>393.2</b>	
Other 4.4%	2016 to 2022	<b>53.0</b>	161.0
<b>Capital Lease Obligations</b>			
United States 5.0%	2018	<b>.5</b>	.7
Foreign 11.3%	2017 to 2036	<b>9.7</b>	1.1
<b>Less: Unamortized Discount</b>		<b>(9.2)</b>	(6.3)
Total Long-term Debt		<b>5,289.4</b>	4,384.7
Less: Current portion of long-term debt		<b>(371.3)</b>	(435.6)
<b>Long-term Debt</b>		<b>\$4,918.1</b>	\$3,949.1

Maturities of long-term debt in each of the next five years and beyond are as follows:

2017	\$371.3
2018	419.4
2019	406.6
2020	353.4
2021	416.9
Thereafter	3,321.8



<b>Total</b>	<b>\$5,289.4</b>
--------------	------------------

Various debt agreements to which we are a party also include financial covenants and other restrictions, including restrictions pertaining to the ability to create property liens and enter into certain sale and leaseback transactions. As of 30 September 2016, we are in compliance with all the financial and other covenants under our debt agreements.

We have entered into a five-year revolving credit agreement maturing 30 April 2018 with a syndicate of banks (the 2013 Credit Agreement ), under which senior unsecured debt is available to both the Company and certain of its subsidiaries. There have been subsequent amendments to the 2013 Credit Agreement, and as of 30 September 2016, the maximum borrowing capacity was \$2,690.0. The 2013 Credit Agreement provides a source of liquidity

---

**Table of Contents**

for the Company and supports its commercial paper program. The Company's only financial covenant is a maximum ratio of total debt to total capitalization no greater than 70%. No borrowings were outstanding under the 2013 Credit Agreement as of 30 September 2016.

On 1 June 2016, we issued a .375% Eurobond for 350 million (\$386.9) that matures on 1 June 2021. The proceeds were used to repay a 2.0% Senior Note of \$350.0 that matured on 2 August 2016.

In September 2015, we made a payment of \$146.6 to redeem 3,000,000 Unidades de Fomento ( UF ) Series E 6.30% Bonds due 22 January 2030 that had a carrying value of \$130.0 and resulted in a net loss of \$16.6 (\$14.2 after-tax, or \$.07 per share). The loss is reflected on the consolidated income statements as Loss on extinguishment of debt.

Additional commitments totaling \$51.3 are maintained by our foreign subsidiaries, all of which was borrowed and outstanding at 30 September 2016.

**Versum Financing**

On 30 September 2016, in connection with the spin-off, Versum entered into certain financing transactions. Versum continued to maintain the financing, further described below, subsequent to the spin-off which occurred on 1 October 2016. Refer to Note 3, Materials Technologies Separation, for additional information on the spin-off.

Versum issued \$425.0 aggregate principal amount of senior unsecured notes (the Notes ). The Notes bear interest at a fixed interest rate of 5.50% per annum and will mature on September 30, 2024. In addition, Versum entered into a credit agreement providing for (i) a senior secured first lien term loan B facility in an aggregate principal amount of \$575.0 (the Term Facility ) and (ii) a senior secured first lien revolving credit facility in an aggregate principal amount of \$200.0 (the Revolving Facility ). Borrowings under the Term Facility bear interest at a rate per annum of, at Versum's option, LIBOR, subject to a minimum floor of 0.75%, plus a margin of 2.50% or an alternate base rate, subject to a minimum floor of 1.75%, plus a margin of 1.50%. Borrowings under the Revolving Facility bear interest initially at a rate per annum of, at Versum's option, LIBOR plus a margin of 2.00% or an alternate base rate plus a margin of 1.00%. The Term Facility amortizes in equal quarterly installments in aggregate annual amounts equal to 1.00% of the original principal amount of the Term Facility, with the balance payable on 30 September 2023. The Revolving Facility matures on 30 September 2021. Lenders under the Revolving Facility have a maximum first lien net leverage ratio covenant (total debt net of cash on hand to total adjusted EBITDA) of 3.25:1.00 and certain other customary covenants. On 30 September 2016, the Term Facility was fully drawn and no borrowings were outstanding under the Revolving Facility.

**16. RETIREMENT BENEFITS**

The Company and certain of its subsidiaries sponsor defined benefit pension plans and defined contribution plans that cover a substantial portion of its worldwide employees. The principal defined benefit pension plans are the U.S. salaried pension plan and the U.K. pension plan. These plans were closed to new participants in 2005 and were replaced with defined contribution plans. The principal defined contribution plan is the Retirement Savings Plan, in which a substantial portion of the U.S. employees participate; a similar plan is offered to U.K. employees. We also provide other postretirement benefits consisting primarily of healthcare benefits to U.S. retirees who meet age and service requirements.

**Table of Contents****Defined Benefit Pension Plans**

Pension benefits earned are generally based on years of service and compensation during active employment. The cost of our defined benefit pension plans included the following components:

	2016		2015		2014	
	U.S.	International	U.S.	International	U.S.	International
Service cost	\$36.5	\$24.3	\$42.2	\$31.3	\$42.6	\$36.0
Interest cost	110.7	44.3	124.7	57.8	130.7	67.2
Expected return on plan assets	(202.0)	(78.3)	(202.0)	(79.8)	(187.8)	(78.1)
Amortization						
Net actuarial loss	85.3	35.6	78.9	41.4	78.3	36.1
Prior service cost	2.8	(.2)	2.8		2.9	.2
Settlements	5.1	1.3	18.9	2.3	4.8	.7
Curtailments		(1.1)	5.3			
Special termination benefits	2.0		7.2	1.5	.2	.1
Other	(.3)	2.1	1.0	2.1		2.0
<b>Net Periodic Benefit Cost</b>	<b>\$40.1</b>	<b>\$28.0</b>	<b>\$79.0</b>	<b>\$56.6</b>	<b>\$71.7</b>	<b>\$64.2</b>

Net periodic benefit cost is primarily included in cost of sales, selling and administrative expense, and pension settlement loss on our consolidated income statements. The amount of net periodic benefit cost capitalized in 2016, 2015, and 2014 was not material.

Certain of our pension plans provide for a lump sum benefit payment option at the time of retirement, or for corporate officers, six months after their retirement date. A participant's vested benefit is considered settled upon cash payment of the lump sum. We recognize pension settlement losses when cash payments exceed the sum of the service and interest cost components of net periodic benefit cost of the plan for the fiscal year. In 2016, 2015, and 2014, we recognized \$6.4, \$21.2 and \$5.5 of settlement losses, respectively, to accelerate recognition of a portion of actuarial losses deferred in accumulated other comprehensive loss primarily associated with the U.S. Supplementary Pension Plan. Special termination benefits for 2016, 2015, and 2014 are primarily related to the business restructuring and cost reduction actions initiated in their respective years. In addition, curtailment gains of \$1.1 and curtailment losses of \$5.3 are also reflected in the business restructuring and cost reduction actions charge in 2016 and 2015, respectively.

We calculate net periodic benefit cost for a given fiscal year based on assumptions developed at the end of the previous fiscal year. The following table sets forth the weighted average assumptions used in the calculation of net periodic benefit cost:

	2016		2015		2014	
	U.S.	International	U.S.	International	U.S.	International
Discount rate <sup>(A)</sup>	4.3%	3.3%	4.3%	3.6%	4.8%	4.3%
Expected return on plan assets	8.0%	6.3%	8.3%	6.1%	8.3%	6.5%
Rate of compensation increase	3.5%	3.5%	3.5%	3.6%	4.0%	3.7%

(A)

Effective in 2016, the Company began to measure the service cost and interest cost components of pension expense 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. The 2016 discount rates used to measure the service cost and interest cost of our U.S. pension plans were 4.5% and 4.1%, respectively. The rates used to measure the service cost and interest cost of our major International pension plans were 3.4% and 3.2%, respectively. The previous method would have used a single discount rate for both service and interest costs. The Company has accounted for this as a change in accounting estimate and, accordingly has accounted for it on a prospective basis. This change does not affect the measurement of the total benefit obligation.

**Table of Contents**

The projected benefit obligation (PBO) is the actuarial present value of benefits attributable to employee service rendered to date, including the effects of estimated future salary increases. The following table sets forth the weighted average assumptions used in the calculation of the PBO:

	2016		2015	
	U.S.	International	U.S.	International
Discount rate	3.5%	2.0%	4.4%	3.4%
Rate of compensation increase	3.5%	3.5%	3.5%	3.5%

The following table reflects the change in the PBO and the change in the fair value of plan assets based on the plan year measurement date, as well as the amounts recognized in the consolidated balance sheets:

	2016		2015	
	U.S.	International	U.S.	International
<b>Change in Projected Benefit Obligation</b>				
Obligation at beginning of year	\$3,139.9	\$1,647.9	\$3,002.9	\$1,735.7
Service cost	36.5	24.3	42.2	31.3
Interest cost	110.7	44.3	124.7	57.8
Amendments	1.2		1.2	(3.1)
Actuarial loss	380.2	376.4	130.4	30.0
Curtailments	(.4)	(1.2)	5.3	(5.1)
Settlement (gain) loss	5.4	(3.4)	6.7	(8.6)
Special termination benefits	2.0		7.2	1.5
Participant contributions		1.6		2.1
Benefits paid	(197.4)	(46.6)	(181.8)	(50.3)
Currency translation/other	(.4)	(193.7)	1.1	(143.4)
<b>Obligation at End of Year</b>	<b>\$3,477.7</b>	<b>\$1,849.6</b>	<b>\$3,139.9</b>	<b>\$1,647.9</b>
<b>Change in Plan Assets</b>				
Fair value at beginning of year	\$2,613.6	\$1,302.8	\$2,746.2	\$1,368.4
Actual return on plan assets	275.2	273.2	(14.0)	25.9
Company contributions	13.9	65.4	63.1	74.4
Participant contributions		1.6		2.1
Benefits paid	(197.4)	(46.6)	(181.8)	(50.3)
Settlements		(3.4)		(8.6)
Currency translation/other		(181.9)	.1	(109.1)
<b>Fair Value at End of Year</b>	<b>\$2,705.3</b>	<b>\$1,411.1</b>	<b>\$2,613.6</b>	<b>\$1,302.8</b>
<b>Funded Status at End of Year</b>	<b>\$(772.4)</b>	<b>\$(438.5)</b>	<b>\$(526.3)</b>	<b>\$(345.1)</b>
<b>Amounts Recognized</b>				
Noncurrent assets	\$	\$	\$4.0	\$3
Accrued liabilities	(24.1)		(15.7)	
Noncurrent liabilities	(748.3)	(438.5)	(514.6)	(345.4)
<b>Net Amount Recognized</b>	<b>\$(772.4)</b>	<b>\$(438.5)</b>	<b>\$(526.3)</b>	<b>\$(345.1)</b>

Certain U.S. plans offered terminated vested participants an election to receive their accrued pension benefit as a one-time lump sum payment in 2016. Benefits paid in 2016 include \$52.9 of lump sum cash payments in connection

with this offering.

**Table of Contents**

The changes in plan assets and benefit obligation that have been recognized in other comprehensive income on a pretax basis during 2016 and 2015 consist of the following:

	2016		2015	
	U.S.	International	U.S.	International
Net actuarial loss arising during the period	\$311.8	\$172.1	\$351.8	\$79.4
Amortization of net actuarial loss	(90.4)	(36.5)	(97.8)	(43.3)
Prior service cost (credit) arising during the period	1.2	(.1)	1.2	(3.1)
Amortization of prior service cost	(2.8)	.2	(2.8)	
<b>Total</b>	<b>\$219.8</b>	<b>\$135.7</b>	<b>\$252.4</b>	<b>\$33.0</b>

The net actuarial loss represents the actual changes in the estimated obligation and plan assets that have not yet been recognized in the consolidated income statements and are included in accumulated other comprehensive loss. Actuarial losses arising during 2016 are primarily attributable to lower discount rates, partially offset by a higher than expected return on plan assets. Accumulated actuarial gains and losses that exceed a corridor are amortized over the average remaining service period of participants, which was approximately 10 years as of 30 September 2016.

The components recognized in accumulated other comprehensive loss on a pretax basis at 30 September consisted of:

	2016		2015	
	U.S.	International	U.S.	International
Net actuarial loss	\$1,273.6	\$769.6	\$1,052.2	\$634.0
Prior service cost	8.5	(1.9)	10.1	(2.0)
Net transition liability		.4		.4
<b>Total</b>	<b>\$1,282.1</b>	<b>\$768.1</b>	<b>\$1,062.3</b>	<b>\$632.4</b>

The amount of accumulated other comprehensive loss at 30 September 2016 that is expected to be recognized as a component of net periodic pension cost during fiscal year 2017, excluding amounts that may be recognized through settlement losses, is as follows:

	U.S.	International
Net actuarial loss	\$103.0	\$58.3
Prior service cost	2.8	(.2)

The accumulated benefit obligation (ABO) is the actuarial present value of benefits attributed to employee service rendered to a particular date, based on current salaries. The ABO for all defined benefit pension plans was \$4,954.9 and \$4,444.8 as of 30 September 2016 and 2015, respectively.

The following table provides information on pension plans where the benefit liability exceeds the value of plan assets:

	30 September 2016		30 September 2015	
	U.S.	International	U.S.	International
<b>Pension Plans with PBO in Excess of Plan Assets:</b>				

PBO	\$3,477.7	\$1,849.6	\$2,917.1	\$1,644.5
Fair value of plan assets	2,705.3	1,411.1	2,386.7	1,299.1
<b>Pension Plans with ABO in Excess of Plan Assets:</b>				
ABO	\$3,242.5	\$1,673.6	\$2,689.2	\$1,498.0
Fair value of plan assets	2,705.3	1,370.1	2,386.7	1,263.2

Included in the tables above are several pension arrangements that are not funded because of jurisdictional practice. The ABO and PBO related to these plans for 2016 were \$108.0 and \$115.3, respectively.



**Table of Contents****Pension Plan Assets**

Our pension plan investment strategy is to invest in diversified portfolios to earn a long-term return consistent with acceptable risk in order to pay retirement benefits and meet regulatory funding requirements while minimizing company cash contributions over time. The plans invest primarily in passive and actively managed equity and debt securities. Equity investments are diversified geographically and by investment style and market capitalization. Fixed income investments include sovereign, corporate and asset-backed securities generally denominated in the currency of the plan.

Asset allocation targets are established based on the long-term return, volatility and correlation characteristics of the asset classes, the profiles of the plans' liabilities, and acceptable levels of risk. Actual allocations vary from target due to market changes and are reviewed regularly. Assets are routinely rebalanced through contributions, benefit payments, and otherwise as deemed appropriate. The actual and target allocations at the measurement date are as follows:

Asset Category	2016 Target Allocation		2016 Actual Allocation		2015 Actual Allocation	
	U.S.	International	U.S.	International	U.S.	International
Equity securities	60%	80%	65%	60%	68%	59%
Debt securities	20%	30%	28%	38%	25%	40%
Real estate/other	0%	10%	7%	1%	7%	0%
Cash			0%	1%	0%	1%
<b>Total</b>			<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

The 8.0% expected return for U.S. plan assets is based on a weighted average of estimated long-term returns of major asset classes and the historical performance of plan assets. The estimated long-term return for equity, debt securities, and real estate is 8.3%, 5.1%, and 6.9%, respectively. In determining asset class returns, we take into account historical long-term returns and the value of active management, as well as other economic and market factors.

The 6.3% expected rate of return for international plan assets is based on a weighted average return for plans outside the U.S., which vary significantly in size, asset structure and expected returns. The expected asset return for the U.K. plan, which represents over 80% of the assets of our International plans, is 6.6% and was derived from expected equity and debt security returns of 7.3% and 3.5%, respectively.

**Table of Contents**

The following table summarizes pension plan assets measured at fair value by asset class (see Note 14, Fair Value Measurements, for definition of the levels):

	30 September 2016				30 September 2015			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
<b>U.S. Qualified Pension Plans</b>								
Cash and cash equivalents	\$12.7	\$12.7	\$	\$	\$11.1	\$11.1	\$	\$
Equity securities	637.0	637.0			681.7	681.7		
Equity mutual funds	300.2	300.2			480.1	480.1		
Equity pooled funds	815.5		815.5		615.1		615.1	
Fixed income:								
Bonds (government and corporate)	747.8		747.8		651.4		651.4	
Real estate pooled funds	192.1			192.1	174.2			174.2
<b>Total U.S. Qualified Pension Plans</b>	<b>\$2,705.3</b>	<b>\$949.9</b>	<b>\$1,563.3</b>	<b>\$192.1</b>	<b>\$2,613.6</b>	<b>\$1,172.9</b>	<b>\$1,266.5</b>	<b>\$174.2</b>
<b>International Pension Plans</b>								
Cash and cash equivalents	\$6.6	\$6.6	\$	\$	\$10.1	\$10.1	\$	\$
Equity pooled funds	854.8		854.8		766.9		766.9	
Fixed income pooled funds	486.9		486.9		465.6		465.6	
Other pooled funds	17.0		9.7	7.3	14.9		8.3	6.6
Insurance contracts	45.8			45.8	45.3			45.3
<b>Total International Pension Plans</b>	<b>\$1,411.1</b>	<b>\$6.6</b>	<b>\$1,351.4</b>	<b>\$53.1</b>	<b>\$1,302.8</b>	<b>\$10.1</b>	<b>\$1,240.8</b>	<b>\$51.9</b>

The following table summarizes changes in fair value of the pension plan assets classified as Level 3, by asset class:

	Real Estate Pooled Funds	Other Pooled Funds	Insurance Contracts	Total
<b>30 September 2014</b>	\$150.2	\$9.3	\$59.7	\$219.2
Actual return on plan assets:				
Assets held at end of year	24.0	(.2)	(11.1)	12.7
Assets sold during the period		.5		.5
Purchases, sales, and settlements, net		(3.0)	(3.3)	(6.3)
<b>30 September 2015</b>	\$174.2	\$6.6	\$45.3	\$226.1
Actual return on plan assets:				
Assets held at end of year	17.9	.1	3.2	21.2
Assets sold during the period		.3		.3
Purchases, sales, and settlements, net		.3	(2.7)	(2.4)

<b>30 September 2016</b>	<b>\$192.1</b>	<b>\$7.3</b>	<b>\$45.8</b>	<b>\$245.2</b>
--------------------------	----------------	--------------	---------------	----------------

The descriptions and fair value methodologies for the U.S. and International pension plan assets are as follows:

*Cash and Cash Equivalents*

The carrying amounts of cash and cash equivalents approximate fair value due to the short-term maturity.

*Equity Securities*

Equity securities are valued at the closing market price reported on a U.S. or international exchange where the security is actively traded and are therefore classified as Level 1 assets.

*Mutual and Pooled Funds*

Shares of mutual funds are valued at the net asset value (NAV) of the fund and are classified as Level 1 assets. Units of pooled funds are valued at the per unit NAV determined by the fund manager and are classified as Level 2 assets. The investments are utilizing NAV as a practical expedient for fair value.

**Table of Contents***Corporate and Government Bonds*

Corporate and government bonds are classified as Level 2 assets, as they are either valued at quoted market prices from observable pricing sources at the reporting date or valued based upon comparable securities with similar yields and credit ratings.

*Real Estate Pooled Funds*

Real estate pooled funds are classified as Level 3 assets, as they are carried at the estimated fair value of the underlying properties. Estimated fair value is calculated utilizing a combination of key inputs, such as revenue and expense growth rates, terminal capitalization rates, and discount rates. These key inputs are consistent with practices prevailing within the real estate investment management industry.

*Other Pooled Funds*

Other pooled funds classified as Level 2 assets are valued at the NAV of the shares held at year end, which is based on the fair value of the underlying investments. Securities and interests classified as Level 3 are carried at the estimated fair value. The estimated fair value is based on the fair value of the underlying investment values, which includes estimated bids from brokers or other third-party vendor sources that utilize expected cash flow streams and other uncorroborated data including counterparty credit quality, default risk, discount rates, and the overall capital market liquidity.

*Insurance Contracts*

Insurance contracts are classified as Level 3 assets, as they are carried at contract value, which approximates the estimated fair value. The estimated fair value is based on the fair value of the underlying investment of the insurance company.

**Contributions and Projected Benefit Payments**

Pension contributions to funded plans and benefit payments for unfunded plans for fiscal year 2016 were \$79.3. Contributions for funded plans resulted primarily from contractual and regulatory requirements. Benefit payments to unfunded plans were due primarily to the timing of retirements and cost reduction actions. We anticipate contributing \$65 to \$85 to the defined benefit pension plans in 2017. These contributions are anticipated to be driven primarily by contractual and regulatory requirements for funded plans and benefit payments for unfunded plans, which are dependent upon timing of retirements and actions to reorganize the business.

Projected benefit payments, which reflect expected future service, are as follows:

	U.S.	International
2017	\$150.3	\$45.7
2018	152.7	48.3
2019	157.2	50.2
2020	161.8	51.1
2021	166.7	54.3
2022 - 2026	909.6	306.9

These estimated benefit payments are based on assumptions about future events. Actual benefit payments may vary significantly from these estimates.

### **Defined Contribution Plans**

We maintain a nonleveraged employee stock ownership plan (ESOP) which forms part of the Air Products and Chemicals, Inc. Retirement Savings Plan (RSP). The ESOP was established in May of 2002. The balance of the RSP is a qualified defined contribution plan including a 401(k) elective deferral component. A substantial portion of U.S. employees are eligible and participate.

We treat dividends paid on ESOP shares as ordinary dividends. Under existing tax law, we may deduct dividends which are paid with respect to shares held by the plan. Shares of the Company's common stock in the ESOP totaled 3,031,534 as of 30 September 2016.

Our contributions to the RSP include a Company core contribution for certain eligible employees who do not receive their primary retirement benefit from the defined benefit pension plans, with the core contribution based

**Table of Contents**

on a percentage of pay that is dependent on years of service. For the RSP, we also make matching contributions on overall employee contributions as a percentage of the employee contribution and include an enhanced contribution for certain eligible employees that do not participate in the defined benefit pension plans. Worldwide contributions expensed to income in 2016, 2015, and 2014 were \$43.2, \$44.2, and \$45.2, respectively.

**Other Postretirement Benefits**

We provide other postretirement benefits consisting primarily of healthcare benefits to certain U.S. retirees who meet age and service requirements. The healthcare benefit is a continued medical benefit until the retiree reaches age 65. Healthcare benefits are contributory, with contributions adjusted periodically. The retiree medical costs are capped at a specified dollar amount, with the retiree contributing the remainder.

The cost of our other postretirement benefit plans includes the following components:

	2016	2015	2014
Service cost	\$2.2	\$2.8	\$3.3
Interest cost	2.0	2.2	2.3
Amortization of net actuarial loss	.7	.8	1.7
<b>Net Periodic Postretirement Cost</b>	<b>\$4.9</b>	<b>\$5.8</b>	<b>\$7.3</b>

We calculate net periodic postretirement cost for a given fiscal year based on assumptions developed at the end of the previous fiscal year. The discount rate assumption used in the calculation of net periodic postretirement cost for 2016, 2015, and 2014 was 2.4%, 2.6%, and 2.4%, respectively.

We measure the other postretirement benefits as of 30 September. The discount rate assumption used in the calculation of the accumulated postretirement benefit obligation was 1.9% and 2.4% for 2016 and 2015, respectively.

The following table reflects the change in the accumulated postretirement benefit obligation and the amounts recognized in the consolidated balance sheets:

	2016	2015
<b>Obligation at beginning of year</b>	<b>\$86.9</b>	<b>\$93.5</b>
Service cost	2.2	2.8
Interest cost	2.0	2.2
Actuarial loss (gain)	7.5	(2.3)
Benefits paid	(12.3)	(9.3)
<b>Obligation at End of Year</b>	<b>\$86.3</b>	<b>\$86.9</b>
<b>Amounts Recognized</b>		
Accrued liabilities	\$11.4	\$10.4
Noncurrent liabilities	74.9	76.5

The changes in benefit obligation that have been recognized in other comprehensive income on a pretax basis during 2016 and 2015 for our other postretirement benefit plans consist of the following:

	<b>2016</b>	2015
Net actuarial loss (gain) arising during the period	<b>\$7.5</b>	\$ (2.3)
Amortization of net actuarial loss	<b>(.7)</b>	(.8)
<b>Total</b>	<b>\$6.8</b>	\$ (3.1)

The net actuarial loss recognized in accumulated other comprehensive loss on a pretax basis was \$18.7 at 30 September 2016 and \$11.9 at 30 September 2015. Of the 30 September 2016 net actuarial loss, it is estimated that \$2.3 will be amortized into net periodic postretirement cost during fiscal year 2017.

The effect of a change in the healthcare trend rate is tempered by a cap on the average retiree medical cost. The expected per capita claims costs are currently assumed to be greater than the annual cap, therefore the assumed healthcare cost trend rate, ultimate trend rate, and the year the ultimate trend rate is reached in 2016 does not

**Table of Contents**

apply as it has no impact on plan obligations. For 2015, the healthcare trend rate was 7%, the ultimate trend rate was 5%, and the year the ultimate trend rate is reached was 2019.

Projected benefit payments are as follows:

2017	\$11.5
2018	11.0
2019	10.7
2020	10.2
2021	9.7
2022 - 2026	35.3

These estimated benefit payments are based on assumptions about future events. Actual benefit payments may vary significantly from these estimates.

**17. COMMITMENTS AND CONTINGENCIES****LITIGATION**

We are involved in various legal proceedings, including commercial, competition, environmental, health, safety, product liability, and insurance matters. In September 2010, the Brazilian Administrative Council for Economic Defense (CADE) issued a decision against our Brazilian subsidiary, Air Products Brasil Ltda., and several other Brazilian industrial gas companies for alleged anticompetitive activities. CADE imposed a civil fine of R\$179.2 million (approximately \$55 at 30 September 2016) on Air Products Brasil Ltda. This fine was based on a recommendation by a unit of the Brazilian Ministry of Justice, whose investigation began in 2003, alleging violation of competition laws with respect to the sale of industrial and medical gases. The fines are based on a percentage of our total revenue in Brazil in 2003.

We have denied the allegations made by the authorities and filed an appeal in October 2010 with the Brazilian courts. On 6 May 2014, our appeal was granted and the fine against Air Products Brasil Ltda. was dismissed. CADE has appealed that ruling and the matter remains pending. We, with advice of our outside legal counsel, have assessed the status of this matter and have concluded that, although an adverse final judgment after exhausting all appeals is possible, such a judgment is not probable. As a result, no provision has been made in the consolidated financial statements. We estimate the maximum possible loss to be the full amount of the fine of R\$179.2 million (approximately \$55 at 30 September 2016) plus interest accrued thereon until final disposition of the proceedings.

Other than this matter, we do not currently believe there are any legal proceedings, individually or in the aggregate, that are reasonably possible to have a material impact on our financial condition, results of operations, or cash flows.

**ENVIRONMENTAL**

In the normal course of business, we are involved in legal proceedings under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA: the federal Superfund law); Resource Conservation and Recovery Act (RCRA); and similar state and foreign environmental laws relating to the designation of certain sites for investigation or remediation. Presently, there are approximately 33 sites on which a final settlement has not been reached where we, along with others, have been designated a potentially responsible party by the Environmental



Protection Agency or are otherwise engaged in investigation or remediation, including cleanup activity at certain of our current and former manufacturing sites. We continually monitor these sites for which we have environmental exposure.

Accruals for environmental loss contingencies are recorded when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. The consolidated balance sheets at 30 September 2016 and 2015 included an accrual of \$81.4 and \$80.6, respectively, primarily as part of other noncurrent liabilities. The environmental liabilities will be paid over a period of up to 30 years. We estimate the exposure for environmental loss contingencies to range from \$81 to a reasonably possible upper exposure of \$95 as of 30 September 2016.

---

**Table of Contents**

Actual costs to be incurred at identified sites in future periods may vary from the estimates, given inherent uncertainties in evaluating environmental exposures. Using reasonably possible alternative assumptions of the exposure level could result in an increase to the environmental accrual. Due to the inherent uncertainties related to environmental exposures, a significant increase to the reasonably possible upper exposure level could occur if a new site is designated, the scope of remediation is increased, a different remediation alternative is identified, or a significant increase in our proportionate share occurs. We do not expect that any sum we may have to pay in connection with environmental matters in excess of the amounts recorded or disclosed above would have a material adverse impact on our financial position or results of operations in any one year.

**Pace**

At 30 September 2016, \$30.1 of the environmental accrual was related to the Pace facility.

In 2006, we sold our Amines business, which included operations at Pace, Florida, and recognized a liability for retained environmental obligations associated with remediation activities at Pace. We are required by the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (USEPA) to continue our remediation efforts. We estimated that it would take 20 years to complete the groundwater remediation, and the costs through completion were estimated to range from \$42 to \$52. As no amount within the range was a better estimate than another, we recognized a pretax expense in fiscal 2006 of \$42 as a component of income from discontinued operations and recorded an environmental accrual of \$42 in continuing operations on the consolidated balance sheets. There has been no change to the estimated exposure range related to the Pace facility.

We have implemented many of the remedial corrective measures at the Pace facility required under 1995 Consent Orders issued by the FDEP and the USEPA. Contaminated soils have been bioremediated, and the treated soils have been secured in a lined on-site disposal cell. Several groundwater recovery systems have been installed to contain and remove contamination from groundwater. We completed an extensive assessment of the site to determine how well existing measures are working, what additional corrective measures may be needed, and whether newer remediation technologies that were not available in the 1990s might be suitable to more quickly and effectively remove groundwater contaminants. Based on assessment results, we completed a focused feasibility study that has identified alternative approaches that may more effectively remove contaminants. We continue to review alternative remedial approaches with the FDEP. In the first quarter of 2015, we entered into a new Consent Order with the FDEP requiring us to continue our remediation efforts at the Pace facility. The costs we are incurring under the new Consent Order are expected to be consistent with our previous estimates.

**Piedmont**

At 30 September 2016, \$17.5 of the environmental accrual was related to the Piedmont site.

On 30 June 2008, we sold our Elkton, Maryland, and Piedmont, South Carolina, production facilities and the related North American atmospheric emulsions and global pressure sensitive adhesives businesses. In connection with the sale, we recognized a liability for retained environmental obligations associated with remediation activities at the Piedmont site. This site is under active remediation for contamination caused by an insolvent prior owner. We are required by the South Carolina Department of Health and Environmental Control to address both contaminated soil and groundwater. Numerous areas of soil contamination have been addressed, and contaminated groundwater is being recovered and treated. We estimate that it will take until 2019 to complete source area remediation with groundwater recovery and treatment, continuing through 2029. Thereafter, we are expecting this site to go into a state of monitored natural attenuation through 2047. We recognized a pretax expense in 2008 of \$24 as a component of income from discontinued operations and recorded an environmental liability of \$24 in continuing operations on the consolidated

balance sheets. There have been no significant changes to the estimated exposure.

**Pasadena**

At 30 September 2016, \$10.4 of the environmental accrual was related to the Pasadena site.

During the fourth quarter of 2012, management committed to permanently shutting down our polyurethane intermediates (PUI) production facility in Pasadena, Texas. In shutting down and dismantling the facility, we have undertaken certain obligations related to soil and groundwater contaminants. We have been pumping and treating groundwater to control off-site contaminant migration in compliance with regulatory requirements and under the

**Table of Contents**

approval of the Texas Commission on Environmental Quality (TCEQ). We estimate that the pump and treat system will continue to operate until 2042. We plan to perform additional work to address other environmental obligations at the site. This additional work includes remediating, as required, impacted soils, investigating groundwater west of the former PUI facility, performing post closure care for two closed RCRA surface impoundment units, and establishing engineering controls. In 2012, we estimated the total exposure at this site to be \$13. There has been no change to the estimated exposure.

**ASSET RETIREMENT OBLIGATIONS**

Our asset retirement obligations are primarily associated with Industrial Gases on-site long-term supply contracts, under which we have built a facility on land owned by the customer and are obligated to remove the facility at the end of the contract term. The retirement of assets includes the contractually required removal of a long-lived asset from service, and encompasses the sale, removal, abandonment, recycling, or disposal of the assets as required at the end of the contract terms. The timing and/or method of settlement of these obligations are conditional on a future event that may or may not be within our control.

Changes to the carrying amount of our asset retirement obligations are as follows:

Balance at 30 September 2014	\$94.0
Additional accruals	17.6
Liabilities settled	(3.6)
Accretion expense	4.7
Currency translation adjustment	(3.3)
Balance at 30 September 2015	\$109.4
Additional accruals	10.4
Liabilities settled	(4.4)
Accretion expense	5.4
Currency translation adjustment	(.9)
<b>Balance at 30 September 2016</b>	<b>\$119.9</b>

These obligations are primarily reflected in other noncurrent liabilities on the consolidated balance sheets.

**GUARANTEES AND WARRANTIES**

In April 2015, we entered into joint venture arrangements in Saudi Arabia. An equity bridge loan has been provided to the joint venture until 2020 to fund equity commitments, and we guaranteed the repayment of our 25% share of this loan. Our venture partner guaranteed repayment of their share. Our maximum exposure under the guarantee is approximately \$100. As of 30 September 2016, we recorded a noncurrent liability of \$94.4 for our obligation to make future equity contributions based on the equity bridge loan.

Air Products has also entered into a sale of equipment contract with the joint venture to engineer, procure, and construct the industrial gas facilities that will supply gases to Saudi Aramco. We have provided bank guarantees to the joint venture of up to \$311 to support our performance under the contract. Exposures under the guarantees decline over time and will be completely extinguished after completion of the project.

We are party to an equity support agreement and operations guarantee related to an air separation facility constructed in Trinidad for a venture in which we own 50%. At 30 September 2016, maximum potential payments under joint and several guarantees were \$29.0. Exposures under the guarantees decline over time and will be completely extinguished by 2024.

During the first quarter of 2014, we sold the remaining portion of our Homecare business and entered into an operations guarantee related to obligations under certain homecare contracts assigned in connection with the transaction. Our maximum potential payment under the guarantee is £20 million (approximately \$25 at 30 September 2016), and our exposure will be extinguished by 2020.

To date, no equity contributions or payments have been made since the inception of these guarantees. The fair value of the above guarantees is not material.

**Table of Contents**

We, in the normal course of business operations, have issued product warranties related to equipment sales. Also, contracts often contain standard terms and conditions which typically include a warranty and indemnification to the buyer that the goods and services purchased do not infringe on third-party intellectual property rights. The provision for estimated future costs relating to warranties is not material to the consolidated financial statements.

We do not expect that any sum we may have to pay in connection with guarantees and warranties will have a material adverse effect on our consolidated financial condition, liquidity, or results of operations.

**UNCONDITIONAL PURCHASE OBLIGATIONS**

We are obligated to make future payments under unconditional purchase obligations as summarized below:

2017	\$942
2018	525
2019	307
2020	298
2021	276
Thereafter	2,983
<b>Total</b>	<b>\$5,331</b>

Approximately \$4,000 of our unconditional purchase obligations relate to helium purchases, which include crude feedstock supply to multiple helium refining plants in North America as well as refined helium purchases from sources around the world. As a rare byproduct of natural gas production in the energy sector, these helium sourcing agreements are medium- to long-term and contain take-or-pay provisions. The refined helium is distributed globally and sold as a merchant gas, primarily under medium-term requirements contracts. While contract terms in the energy sector are longer than those in merchant, helium is a rare gas used in applications with few or no substitutions because of its unique physical and chemical properties.

Approximately \$330 of our long-term unconditional purchase obligations relate to feedstock supply for numerous HyCO (hydrogen, carbon monoxide, and syngas) facilities. The price of feedstock supply is principally related to the price of natural gas. However, long-term take-or-pay sales contracts to HyCO customers are generally matched to the term of the feedstock supply obligations and provide recovery of price increases in the feedstock supply. Due to the matching of most long-term feedstock supply obligations to customer sales contracts, we do not believe these purchase obligations would have a material effect on our financial condition or results of operations.

The unconditional purchase obligations also include other product supply and purchase commitments and electric power and natural gas supply purchase obligations, which are primarily pass-through contracts with our customers.

Purchase commitments to spend approximately \$350 for additional plant and equipment are included in the unconditional purchase obligations in 2017. In addition, we have purchase commitments totaling approximately \$500 in 2017 and 2018 relating to our long-term sale of equipment project for Saudi Aramco's Jazan oil refinery.

**18. CAPITAL STOCK****Common Stock**

Authorized common stock consists of 300 million shares with a par value of \$1 per share. As of 30 September 2016, 249 million shares were issued, with 217 million outstanding.

On 15 September 2011, the Board of Directors authorized the repurchase of up to \$1,000 of our outstanding common stock. We repurchase shares pursuant to Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended, through repurchase agreements established with several brokers. We did not purchase any of our outstanding shares during fiscal year 2016. At 30 September 2016, \$485.3 in share repurchase authorization remains.

**Table of Contents**

The following table reflects the changes in common shares:

Year ended 30 September	2016	2015	2014
<b>Number of Common Shares Outstanding</b>			
Balance, beginning of year	215,359,113	213,538,144	211,179,257
Issuance of treasury shares for stock option and award plans	1,991,712	1,820,969	2,358,887
Balance, end of year	217,350,825	215,359,113	213,538,144

**Preferred Stock**

Authorized preferred stock consists of 25 million shares with a par value of \$1 per share, of which 2.5 million were designated as Series A Junior Participating Preferred Stock. There were no shares issued or outstanding as of 30 September 2016 and 2015.

**19. SHARE-BASED COMPENSATION**

We have various share-based compensation programs, which include deferred stock units, stock options, and restricted stock. Under all programs, the terms of the awards are fixed at the grant date. We issue shares from treasury stock upon the payout of deferred stock units, the exercise of stock options, and the issuance of restricted stock awards. As of 30 September 2016, there were 4,840,837 shares available for future grant under our Long-Term Incentive Plan, which is shareholder approved.

Share-based compensation cost recognized in the consolidated income statements is summarized below:

	2016	2015	2014
Before-Tax Share-Based Compensation Cost	\$37.6	\$45.7	\$44.0
Income tax benefit	(13.1)	(16.0)	(15.6)
After-Tax Share-Based Compensation Cost	\$24.5	\$29.7	\$28.4

Before-tax share-based compensation cost is primarily included in selling and administrative expense on our consolidated income statements. The amount of share-based compensation cost capitalized in 2016, 2015, and 2014 was not material.

Total before-tax share-based compensation cost by type of program was as follows:

	2016	2015	2014
Deferred stock units	\$29.9	\$28.8	\$20.2
Stock options	4.2	12.6	21.6
Restricted stock	3.5	4.3	2.2
<b>Before-Tax Share-Based Compensation Cost</b>	<b>\$37.6</b>	<b>\$45.7</b>	<b>\$44.0</b>

**Deferred Stock Units**

We have granted deferred stock units to executives, selected employees, and outside directors. These deferred stock units entitle the recipient to one share of common stock upon vesting, which is conditioned, for employee recipients,



on continued employment during the deferral period and may be conditioned on achieving certain performance targets. We grant deferred stock unit awards with a two to five year deferral period that is subject to payout upon death, disability, or retirement. Deferred stock units issued to outside directors are paid after service on the Board of Directors ends at the time elected by the director (not to exceed 10 years after service ends). We generally expense the grant-date fair value of these awards on a straight-line basis over the vesting period; however, expense recognition is accelerated for retirement eligible individuals who meet the requirements for vesting upon retirement.

In 2015, we granted 119,272 market-based deferred stock units. The market-based deferred stock units vest as long as the employee continues to be employed by the Company and upon the achievement of the performance target. The performance target, which is approved by the Compensation Committee, is the Company's total shareholder return (share price appreciation and dividends paid) in relation to a defined peer group over a three-year performance period.

**Table of Contents**

In 2016, we granted 130,167 market-based deferred stock units. The market-based deferred stock units are earned out at the end of a three-year performance period beginning 1 October 2015 and ending 30 September 2018.

The fair value of market-based deferred stock units was estimated using a Monte Carlo simulation model as these equity awards are tied to a market condition. The model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the grant and calculates the fair value of the awards. We generally expense the grant-date fair value of these awards on a straight line basis over the vesting period. The calculation of the fair value of market-based deferred stock units used the following assumptions:

	<b>2016</b>	2015
Expected volatility	<b>20.5 %</b>	19.6 %
Risk-free interest rate	<b>1.2 %</b>	.9 %
Expected dividend yield	<b>2.2 %</b>	2.5 %

The estimated grant-date fair value of market-based deferred stock units was \$135.49 and \$194.51 per unit in 2016 and 2015.

In addition, during 2016, we granted 153,792 time-based deferred stock units at a weighted average grant-date fair value of \$137.12.

<b>Deferred Stock Units</b>	Shares (000)	Weighted Average Grant-Date Fair Value
Outstanding at 30 September 2015	1,056	\$102.01
Granted	284	136.37
Paid out	(299)	77.81
Forfeited/adjustments	(40)	90.83
<b>Outstanding at 30 September 2016</b>	<b>1,001</b>	<b>\$119.44</b>

Cash payments made for deferred stock units were \$2.9, \$9.6, and \$2.1 in 2016, 2015, and 2014, respectively. As of 30 September 2016, there was \$41.4 of unrecognized compensation cost related to deferred stock units. The cost is expected to be recognized over a weighted average period of 2.2 years. The total fair value of deferred stock units paid out during 2016, 2015, and 2014, including shares vested in prior periods, was \$41.6, \$35.5, and \$31.8, respectively.

**Stock Options**

We have granted awards of options to purchase common stock to executives and selected employees. The exercise price of stock options equals the market price of our stock on the date of the grant. Options generally vest incrementally over three years, and remain exercisable for ten years from the date of grant. In 2016, no stock options were awarded.

Fair values of stock options were estimated using a Black Scholes model that used the assumptions noted in the table below. Expected volatility and expected dividend yield are based on actual historical experience of our stock and dividends over the historical period equal to the expected life. The expected life represents the period of time that options granted are expected to be outstanding based on an analysis of Company-specific historical exercise data. Ranges are used when certain groups of employees exhibit different behavior, such as timing of exercise. The risk-free rate is based on the U.S. Treasury Strips with terms equal to the expected time of exercise as of the grant date.

	2015	2014	
Expected volatility	30.3%	29.8%	31.1%
Expected dividend yield	2.6%	2.4	2.9%
Expected life (in years)	7.5	6.5	8.4
Risk-free interest rate	2.2%	2.0%	2.7%

The weighted average grant-date fair value of options granted during 2015 and 2014 was \$37.19 and \$29.10 per option, respectively.

**Table of Contents**

A summary of stock option activity is presented below:

<b>Stock Options</b>	Shares (000)	Weighted Average Exercise Price
Outstanding at 30 September 2015	5,725	\$87.35
Granted		
Exercised	(1,783)	80.66
Forfeited	(26)	106.52
<b>Outstanding at 30 September 2016</b>	<b>3,916</b>	<b>\$90.28</b>
<b>Exercisable at 30 September 2016</b>	<b>3,537</b>	<b>\$86.99</b>
<b>Stock Options</b>	Weighted Average Remaining Contractual Terms (in years)	Aggregate Intrinsic Value
<b>Outstanding at 30 September 2016</b>	<b>5.0</b>	<b>\$235</b>
<b>Exercisable at 30 September 2016</b>	<b>4.7</b>	<b>\$224</b>

The aggregate intrinsic value represents the amount by which our closing stock price of \$150.34 as of 30 September 2016 exceeds the exercise price multiplied by the number of in-the-money options outstanding or exercisable.

The total intrinsic value of stock options exercised during 2016, 2015, and 2014 was \$115.3, \$115.5, and \$125.3, respectively.

Compensation cost is generally recognized over the stated vesting period consistent with the terms of the arrangement (i.e., either on a straight-line or graded-vesting basis). Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement. As of 30 September 2016, there was \$1.1 of unrecognized compensation cost related to nonvested stock options, which is expected to be recognized over a weighted average period of 0.9 years.

Cash received from option exercises during 2016 was \$141.3. The total tax benefit realized from stock option exercises in 2016 was \$39.8, of which \$25.0 was the excess tax benefit.

**Restricted Stock**

The grant-date fair value of restricted stock is estimated on the date of grant based on the market price of the stock, and compensation cost is generally amortized to expense on a straight-line basis over the vesting period during which employees perform related services. Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement.

We have issued shares of restricted stock to certain officers. Participants are entitled to cash dividends and to vote their respective shares. Restrictions on shares lift in one to four years or upon the earlier of retirement, death, or disability. The shares are nontransferable while subject to forfeiture.

<b>Restricted Stock</b>	Shares (000)	Weighted Average Grant-Date Fair Value
Outstanding at 30 September 2015	83	\$121.17

Granted	33	138.00
Vested	(31)	119.95
<b>Outstanding at 30 September 2016</b>	<b>85</b>	<b>\$128.16</b>

As of 30 September 2016, there was \$5.1 of unrecognized compensation cost related to restricted stock awards. The cost is expected to be recognized over a weighted average period of 2.6 years. The total fair value of restricted stock vested during 2016, 2015, and 2014 was \$4.3, \$1.4, and \$12.1, respectively.

**Table of Contents****20. ACCUMULATED OTHER COMPREHENSIVE LOSS**

The table below summarizes changes in accumulated other comprehensive loss (AOCL), net of tax, attributable to Air Products:

	Net loss on derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
<b>Balance at 30 September 2013</b>	<b>\$(4.1)</b>	<b>\$(61.5)</b>	<b>\$(955.0)</b>	<b>\$(1,020.6)</b>
Other comprehensive income (loss) before reclassifications	(15.2)	(213.1)	(74.2)	(302.5)
Amounts reclassified from AOCL	(9.1)		84.7	75.6
Net current period other comprehensive income (loss)	\$(24.3)	\$(213.1)	\$10.5	\$(226.9)
Amount attributable to noncontrolling interest	.1	(5.9)	.2	(5.6)
<b>Balance at 30 September 2014</b>	<b>\$(28.5)</b>	<b>\$(268.7)</b>	<b>\$(944.7)</b>	<b>\$(1,241.9)</b>
Other comprehensive income (loss) before reclassifications	(35.0)	(699.3)	(278.5)	(1,012.8)
Amounts reclassified from AOCL	20.8		97.0	117.8
Net current period other comprehensive income (loss)	\$(14.2)	\$(699.3)	\$(181.5)	\$(895.0)
Amount attributable to noncontrolling interest	.2	(11.5)	.3	(11.0)
<b>Balance at 30 September 2015</b>	<b>\$(42.9)</b>	<b>\$(956.5)</b>	<b>\$(1,126.5)</b>	<b>\$(2,125.9)</b>
Other comprehensive income (loss) before reclassifications	13.7	9.9	(335.1)	(311.5)
Amounts reclassified from AOCL	(36.0)	2.7	87.2	53.9
Net current period other comprehensive income (loss)	\$(22.3)	\$12.6	\$(247.9)	\$(257.6)
Amount attributable to noncontrolling interest	(.2)	5.4	(.4)	4.8
<b>Balance at 30 September 2016</b>	<b>\$(65.0)</b>	<b>\$(949.3)</b>	<b>\$(1,374.0)</b>	<b>\$(2,388.3)</b>

The table below summarizes the reclassifications out of accumulated other comprehensive loss and the affected line item on the consolidated income statements:

	2016	2015	2014
<b>(Gain) Loss on Cash Flow Hedges, net of tax</b>			
Sales/Cost of sales	\$ .2	\$ .6	\$ .7
Other income (expense), net	(46.2)	16.9	(8.7)
Interest expense	10.0	3.3	(1.1)
<b>Total (Gain) Loss on Cash Flow Hedges, net of tax</b>	<b>\$(36.0)</b>	<b>\$20.8</b>	<b>\$(9.1)</b>
<b>Currency Translation Adjustment<sup>(A)</sup></b>	<b>\$2.7</b>	<b>\$</b>	<b>\$</b>
<b>Pension and Postretirement Benefits, net of tax<sup>(B)</sup></b>	<b>\$87.2</b>	<b>\$97.0</b>	<b>\$84.7</b>

<sup>(A)</sup> The impact is reflected in Other income (expense), net and primarily relates to the sale of an equity affiliate in the first quarter of 2016. Refer to Note 8, Summarized Financial Information of Equity Affiliates.

<sup>(B)</sup> The components include items such as prior service cost amortization, actuarial loss amortization, and settlements and are reflected in net periodic benefit cost. Refer to Note 16, Retirement Benefits.

**21. NONCONTROLLING INTERESTS**

**INDURA S.A.**

**Redeemable Noncontrolling Interest**

In 2012, we purchased a controlling equity interest in the outstanding shares of Indura S.A. As part of the purchase agreement, the largest minority shareholder in Indura S.A. had the right to exercise a put option to require us to purchase up to a 30.5% equity interest during the two-year period beginning on 1 July 2015, at a

**Table of Contents**

redemption value equal to the greater of fair market value or the acquisition date value escalated by an inflation factor (the floor value). The put option was not accounted for separate from the minority interest shares that were subject to the put option. The redemption feature of the put option required classification of the minority shareholder's interest in the consolidated balance sheet outside of equity under the caption Redeemable Noncontrolling Interest.

In July 2015, we completed the purchase of the 30.5% equity interest in our Indura S.A. subsidiary from the largest minority shareholder for \$277.9 based on terms substantially consistent with the original purchase agreement. The purchase was funded by the issuance of commercial paper. We currently have a 97.8% controlling equity interest in Indura S.A.

The following is a summary of the changes in redeemable noncontrolling interest for the year ended 30 September 2015:

Balance at 30 September 2014	\$287.2
Net income	11.5
Dividends	(2.0)
Purchase of noncontrolling interest	(277.9)
Currency translation adjustment	(18.8)
Balance at 30 September 2015	\$

As redeemable noncontrolling interest is not part of total equity, the impacts above are excluded from our consolidated statements of equity.

**22. EARNINGS PER SHARE**

The following table sets forth the computation of basic and diluted earnings per share (EPS):

<b>30 September</b>	<b>2016</b>	2015	2014
<b>Numerator</b>			
Income from continuing operations	<b>\$1,515.3</b>	\$1,284.7	\$994.6
Income (Loss) from discontinued operations	<b>(884.2)</b>	(6.8)	(2.9)
<b>Net Income Attributable to Air Products</b>	<b>\$631.1</b>	\$1,277.9	\$991.7
<b>Denominator (in millions)</b>			
Weighted average common shares Basic	<b>216.4</b>	214.9	212.7
Effect of dilutive securities			
Employee stock option and other award plans	<b>1.9</b>	2.4	2.5
Weighted average common shares Diluted	<b>218.3</b>	217.3	215.2
<b>Basic EPS Attributable to Air Products</b>			
Income from continuing operations	<b>\$7.00</b>	\$5.98	\$4.68
Income (Loss) from discontinued operations	<b>(4.08)</b>	(.03)	(.02)
<b>Net Income Attributable to Air Products</b>	<b>\$2.92</b>	\$5.95	\$4.66
<b>Diluted EPS Attributable to Air Products</b>			
Income from continuing operations	<b>\$6.94</b>	\$5.91	\$4.62



Income (Loss) from discontinued operations	(4.05)	(.03)	(.01)
<b>Net Income Attributable to Air Products</b>	<b>\$2.89</b>	<b>\$5.88</b>	<b>\$4.61</b>

Diluted EPS attributable to Air Products reflects the potential dilution that could occur if stock options or other share-based awards were exercised or converted into common stock. The dilutive effect is computed using the treasury stock method, which assumes all share-based awards are exercised and the hypothetical proceeds from exercise are used by the Company to purchase common stock at the average market price during the period. The incremental shares (difference between shares assumed to be issued versus purchased), to the extent they would have been dilutive, are included in the denominator of the diluted EPS calculation. Outstanding

**Table of Contents**

share-based awards of .2 million shares, .2 million shares, and .6 million shares were antidilutive and therefore excluded from the computation of diluted EPS for 2016, 2015, and 2014, respectively.

**23. INCOME TAXES**

The following table summarizes the income of U.S. and foreign operations before taxes:

	2016	2015	2014
<b>Income from Continuing Operations before Taxes</b>			
United States	\$897.5	\$742.0	\$562.2
Foreign	1,086.1	846.2	651.8
Income from equity affiliates	148.6	154.5	151.4
<b>Total</b>	<b>\$2,132.2</b>	<b>\$1,742.7</b>	<b>\$1,365.4</b>

The following table shows the components of the provision for income taxes:

	2016	2015	2014
<b>Current Tax Provision</b>			
Federal	\$237.9	\$177.1	\$19.3
State	29.1	16.9	13.0
Foreign	256.6	221.4	211.6
	<b>523.6</b>	<b>415.4</b>	<b>243.9</b>
<b>Deferred Tax Provision</b>			
Federal	42.2	(3.5)	98.2
State	3.6	19.1	(2.7)
Foreign	17.1	(12.7)	30.0
	<b>62.9</b>	<b>2.9</b>	<b>125.5</b>
<b>Income Tax Provision</b>	<b>\$586.5</b>	<b>\$418.3</b>	<b>\$369.4</b>

A reconciliation of the differences between the United States federal statutory tax rate and the effective tax rate is as follows:

(Percent of income before taxes)	2016	2015	2014
U.S. federal statutory tax rate	35.0%	35.0%	35.0%
State taxes, net of federal benefit	1.1	1.0	.5
Income from equity affiliates	(2.4)	(3.0)	(3.9)
Foreign tax differentials	(7.0)	(6.6)	(8.2)
U.S. taxes on foreign earnings	(2.3)	(1.6)	(1.7)
Domestic production activities	(.8)	(.9)	(.7)
Non-deductible goodwill impairment charge			8.0
Non-U.S. subsidiary tax election			(3.8)
Business separation costs	3.1	.2	
Other <sup>(A)</sup>	.8	(.1)	1.9
<b>Effective Tax Rate</b>	<b>27.5%</b>	<b>24.0%</b>	<b>27.1%</b>

(A) Other includes the impact of Chilean tax rate changes of 1.5% in 2014.

Income tax payments, net of refunds, were \$440.8 in 2016, \$392.9 in 2015, and \$160.6 in 2014.

Foreign tax differentials represent the differences between foreign earnings subject to foreign tax rates lower than the U.S. federal statutory tax rate of 35.0%. Foreign earnings are subject to local country tax rates that are generally below the 35.0% U.S. federal statutory rate and include tax holidays and incentives. As a result, our effective non-U.S. tax rate is typically lower than the U.S. statutory rate. If foreign pre-tax earnings increase relative to U.S. pre-tax earnings, this rate difference could increase. The jurisdictions in which we earn pre-tax earnings subject to lower foreign taxes than the U.S. statutory rate include South Korea, Taiwan, the United

**Table of Contents**

Kingdom, China, Canada, Spain and Belgium. As more than 80% of the undistributed earnings are in countries with a statutory tax rate of 24% or higher, we do not generate a disproportionate amount of taxable income in countries with very low tax rates. U.S. taxes on foreign earnings is a tax benefit primarily due to foreign tax credits on the repatriation of foreign earnings to the U.S.

In 2016, the effective tax rate was impacted by tax costs of \$51.8 incurred in anticipation of the tax-free spin-off of Versum, primarily for a dividend declared during the third quarter of 2016 to repatriate \$443.8 from a subsidiary in South Korea to the U.S. Previously, most of these foreign earnings were considered to be indefinitely reinvested. In addition, a tax benefit was not available on a significant portion of the business separation costs. Refer to Note 3, Materials Technologies Separation, for additional information.

In 2014, the effective tax rate was impacted by losses from transactions and a tax election made with respect to a non-U.S. subsidiary resulting in an income tax benefit of \$51.6. This benefit was partially offset by income tax expense of \$20.6 related to the tax reform legislation enacted in Chile. The effective tax rate was also impacted by the goodwill impairment charge of \$305.2 that was not deductible for tax purposes. See Note 10, Goodwill, for additional information regarding the impairment charge.

The significant components of deferred tax assets and liabilities are as follows:

<b>30 September</b>	<b>2016</b>	2015
<b>Gross Deferred Tax Assets</b>		
Retirement benefits and compensation accruals	<b>\$537.9</b>	\$468.7
Tax loss carryforwards	<b>93.0</b>	116.7
Tax credits and other tax carryforwards	<b>56.0</b>	43.8
Reserves and accruals	<b>80.1</b>	71.9
Partnership and other investments	<b>4.8</b>	6.2
Other	<b>45.8</b>	66.3
Valuation allowance	<b>(155.2)</b>	(103.6)
<b>Deferred Tax Assets</b>	<b>662.4</b>	670.0
<b>Gross Deferred Tax Liabilities</b>		
Plant and equipment	<b>1,034.8</b>	1,124.6
Currency gains	<b>46.4</b>	65.7
Unremitted earnings of foreign entities	<b>5.4</b>	62.7
Intangible assets	<b>134.1</b>	135.6
Other	<b>16.1</b>	2.1
<b>Deferred Tax Liabilities</b>	<b>1,236.8</b>	1,390.7
<b>Net Deferred Income Tax Liability</b>	<b>\$574.4</b>	\$720.7

Deferred tax assets and liabilities are included within the consolidated financial statements as follows:

	<b>2016</b>	2015
<b>Deferred Tax Assets</b>		
Other noncurrent assets	<b>\$192.7</b>	\$82.7
<b>Deferred Tax Liabilities</b>		
Deferred income taxes	<b>767.1</b>	803.4

<b>Net Deferred Income Tax Liability</b>	<b>\$574.4</b>	<b>\$720.7</b>
------------------------------------------	----------------	----------------

Gross federal loss and tax credit carryforwards as of 30 September 2016 were \$137.1 and \$25.7, respectively. The federal loss carryforward is primarily a capital loss due to a 2014 tax election related to a non-U.S. subsidiary that expires in 2019. The federal tax credit carryforwards expire in 2025 and 2026. Gross state loss and tax credit carryforwards as of 30 September 2016 were \$123.2 and \$3.3, respectively. The state tax carryforwards have expiration periods between 2018 and 2034. Gross foreign loss and tax credit carryforwards as of 30 September 2016 were \$155.0 and \$27.0, respectively. Foreign tax carryforwards of \$119.5 have expiration periods between 2017 and 2026; the remainder have unlimited carryforward periods.

**Table of Contents**

The valuation allowance as of 30 September 2016 of \$155.2 primarily related to the tax benefit on the federal capital loss carryforward of \$48.0, tax benefit of foreign loss carryforwards of \$37.7, and capital assets of \$58.0 that were generated from the loss recorded on the exit from the Energy-from-Waste business in 2016. If events warrant the reversal of the valuation allowance, it would result in a reduction of tax expense. We believe it is more likely than not that future earnings and reversal of deferred tax liabilities will be sufficient to utilize our deferred tax assets, net of existing valuation allowance, at 30 September 2016. The deferred tax liability associated with unremitted earnings of foreign entities decreased in part due to the dividend to repatriate cash from a foreign subsidiary in South Korea. This amount was also impacted by ongoing activity including earnings, dividend payments, tax credit adjustments, and currency translation impacting the undistributed earnings of our foreign subsidiaries and corporate joint ventures which are not considered to be indefinitely reinvested outside of the U.S.

We record U.S. income taxes on the undistributed earnings of our foreign subsidiaries and corporate joint ventures unless those earnings are indefinitely reinvested outside of the U.S. These cumulative undistributed earnings that are considered to be indefinitely reinvested in foreign subsidiaries and corporate joint ventures are included in retained earnings on the consolidated balance sheets and amounted to \$6,300.9 as of 30 September 2016. An estimated \$1,467.8 in U.S. income and foreign withholding taxes would be due if these earnings were remitted as dividends after payment of all deferred taxes.

A reconciliation of the beginning and ending amount of the unrecognized tax benefits is as follows:

<b>Unrecognized Tax Benefits</b>	<b>2016</b>	2015	2014
Balance at beginning of year	<b>\$97.5</b>	\$108.7	\$124.3
Additions for tax positions of the current year	<b>15.0</b>	6.9	8.1
Additions for tax positions of prior years	<b>3.8</b>	7.5	4.9
Reductions for tax positions of prior years	<b>(.3)</b>	(7.9)	(14.6)
Settlements	<b>(5.6)</b>	(.6)	
Statute of limitations expiration	<b>(3.0)</b>	(11.2)	(14.0)
Foreign currency translation	<b>(.5)</b>	(5.9)	
<b>Balance at End of Year</b>	<b>\$106.9</b>	\$97.5	\$108.7

At 30 September 2016 and 2015, we had \$106.9 and \$97.5 of unrecognized tax benefits, excluding interest and penalties, of which \$64.5 and \$62.5, respectively, would impact the effective tax rate if recognized.

Interest and penalties related to unrecognized tax benefits are recorded as a component of income tax expense and totaled \$2.3 in 2016, \$(1.8) in 2015, and \$1.2 in 2014. Our accrued balance for interest and penalties was \$9.8 and \$7.5 as of 30 September 2016 and 2015, respectively.

**Table of Contents**

We are currently under examination in a number of tax jurisdictions, some of which may be resolved in the next twelve months. As a result, it is reasonably possible that a change in the unrecognized tax benefits may occur during the next twelve months. However, quantification of an estimated range cannot be made at this time.

We generally remain subject to examination in the following major tax jurisdictions for the years indicated below:

<b>Major Tax Jurisdiction</b>	<b>Open Tax Years</b>
<b>North America</b>	
United States	2011 2016
Canada	2012 2016
<b>Europe</b>	
France	2013 2016
Germany	2011 2016
Netherlands	2011 2016
Spain	2011 2016
United Kingdom	2013 2016
<b>Asia</b>	
China	2010 2016
Singapore	2010 2016
South Korea	2010 2016
Taiwan	2011 2016
<b>Latin America</b>	
Chile	2013 2016

**24. SUPPLEMENTAL INFORMATION****Other Receivables and Current Assets**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Derivative instruments	<b>\$170.9</b>	\$72.9
Other receivables	<b>197.5</b>	167.6
Current capital lease receivables	<b>88.2</b>	84.2
Prepaid inventory	<b>92.8</b>	
Other	<b>6.2</b>	18.8
	<b>\$555.6</b>	\$343.5

**Other Noncurrent Assets**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Derivative instruments	<b>\$204.4</b>	\$246.0
Other long-term receivables	<b>20.6</b>	21.4
Deferred financing cost, net	<b>29.6</b>	20.2
Prepaid tax	<b>53.5</b>	31.3
Deferred tax assets	<b>192.7</b>	82.7

Deposits	<b>36.5</b>	40.1
Other	<b>200.0</b>	206.9
	<b>\$737.3</b>	\$648.6



**Table of Contents****Payables and Accrued Liabilities**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Trade creditors	<b>\$676.1</b>	\$621.9
Customer advances	<b>376.1</b>	195.3
Accrued payroll and employee benefits	<b>262.6</b>	272.9
Pension and postretirement benefits	<b>35.5</b>	26.1
Dividends payable	<b>186.9</b>	174.4
Outstanding payments in excess of certain cash balances	<b>11.9</b>	27.5
Accrued interest expense	<b>47.9</b>	52.9
Derivative instruments	<b>74.0</b>	114.6
Severance and other costs associated with business restructuring and cost reduction actions	<b>16.3</b>	41.7
Other	<b>123.3</b>	114.4
	<b>\$1,810.6</b>	\$1,641.7

**Other Noncurrent Liabilities**

<b>30 September</b>	<b>2016</b>	<b>2015</b>
Pension benefits	<b>\$1,186.8</b>	\$860.0
Postretirement benefits	<b>74.9</b>	76.5
Other employee benefits	<b>108.3</b>	106.7
Contingencies related to uncertain tax positions	<b>95.6</b>	91.1
Advance payments	<b>43.8</b>	135.1
Environmental liabilities	<b>70.3</b>	71.6
Derivative instruments	<b>21.8</b>	10.6
Asset retirement obligations	<b>116.1</b>	106.5
Obligation for future contribution to an equity affiliate	<b>94.4</b>	67.5
Other	<b>61.4</b>	28.4
	<b>\$1,873.4</b>	\$1,554.0

**Other Income (Expense), Net**

<b>30 September</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
Technology and royalty income	<b>\$20.1</b>	\$25.0	\$26.8
Interest income	<b>6.2</b>	4.6	9.4
Foreign exchange	<b>(5.8)</b>	(22.3)	(7.7)
Sale of assets and investments	<b>10.1</b>	37.1	12.5
Contract settlements	<b>12.6</b>		2.8
Other	<b>14.9</b>	2.9	9.0
	<b>\$58.1</b>	\$47.3	\$52.8

**Gain on Land Sales**

During the fourth quarter of 2015, we sold two parcels of land resulting in a gain of \$33.6 (\$28.3 after-tax, or \$.13 per share). The gain is reflected in sale of assets and investments in the table above.



**Table of Contents****25. SUMMARY BY QUARTER (UNAUDITED)**

These tables summarize the unaudited results of operations for each quarter of 2016 and 2015:

<b>2016</b>		Q1	Q2	Q3	Q4	Total
Sales		\$2,355.8	\$2,271.2	\$2,434.4	\$2,463.0	\$9,524.4
Gross profit <sup>(A)</sup>		760.1	752.2	795.1	814.3	3,121.7
Business separation costs <sup>(B)</sup>		12.0	7.4	9.5	23.3	52.2
Business restructuring and cost reduction actions <sup>(C)</sup>			8.6	14.2	11.1	33.9
Pension settlement loss <sup>(D)</sup>			2.6	1.0	2.8	6.4
Operating income <sup>(A)</sup>		510.6	513.3	535.1	547.0	2,106.0
Loss on extinguishment of debt <sup>(E)</sup>					6.9	6.9
Income tax provision		135.9	132.5 <sup>(F)</sup>	179.5 <sup>(F)</sup>	138.6 <sup>(F)</sup>	586.5 <sup>(F)</sup>
Net income (loss)		372.0	(465.5)	354.1	400.9	661.5
Net income attributable to Air Products						
Income from continuing operations		377.8	379.8	355.7	402.0	1,515.3
Loss from discontinued operations		(14.2)	(853.1)	(8.9)	(8.0)	(884.2)
Net income (loss) attributable to Air Products		363.6	(473.3)	346.8	394.0	631.1
Basic Earnings Per Common Share Attributable to Air Products						
Income from continuing operations		1.75	1.76	1.64	1.85	7.00
Loss from discontinued operations		(.07)	(3.95)	(.04)	(.04)	(4.08)
Net income (loss) attributable to Air Products		1.68	(2.19)	1.60	1.81	2.92
Diluted Earnings Per Common Share Attributable to Air Products						
Income from continuing operations		1.73	1.74	1.63	1.84	6.94
Loss from discontinued operations		(.06)	(3.91)	(.04)	(.04)	(4.05)
Net income (loss) attributable to Air Products		1.67	(2.17)	1.59	1.80	2.89
Dividends declared per common share		.81	.86	.86	.86	3.39
Market price per common share:	High	143.83	147.16	152.16	157.84	
	Low	126.65	114.64	134.15	137.31	

**Table of Contents**

<b>2015</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Total</b>
Sales	\$2,560.8	\$2,414.5	\$2,470.2	\$2,449.4	\$9,894.9
Gross profit	731.1	716.3	755.0	753.5	2,955.9
Business separation costs <sup>(B)</sup>				7.5	7.5
Business restructuring and cost reduction actions <sup>(C)</sup>	32.4	55.4	58.2	61.7	207.7
Pension settlement loss <sup>(D)</sup>		12.6	1.6	7.0	21.2
Gain on previously held equity interest <sup>(G)</sup>	17.9				17.9
Gain on land sales <sup>(H)</sup>				33.6	33.6
Operating income	432.3	376.9	424.8	474.3	1,708.3
Loss on extinguishment of debt <sup>(E)</sup>				16.6	16.6
Income tax provision	107.1	87.7	104.1	119.4	418.3
Net income	337.5	296.9	333.2	350.0	1,317.6
Net income attributable to Air Products					
Income from continuing operations	326.3	291.9	320.5	346.0	1,284.7
Loss from discontinued operations	(1.7)	(1.9)	(1.7)	(1.5)	(6.8)
Net income attributable to Air Products	324.6	290.0	318.8	344.5	1,277.9
Basic Earnings Per Common Share Attributable to Air Products					
Income from continuing operations	1.53	1.36	1.49	1.61	5.98
Loss from discontinued operations	(.01)	(.01)	(.01)	(.01)	(.03)
Net income attributable to Air Products	1.52	1.35	1.48	1.60	5.95
Diluted Earnings Per Common Share Attributable to Air Products					
Income from continuing operations	1.51	1.34	1.48	1.59	5.91
Loss from discontinued operations	(.01)	(.01)	(.01)	(.01)	(.03)
Net income attributable to Air Products	1.50	1.33	1.47	1.58	5.88
Dividends declared per common share	.77	.81	.81	.81	3.20
Market price per common share:					
High	149.61	158.20	153.93	148.56	
Low	118.20	137.07	136.69	123.66	

(A) Changes in estimates on projects accounted for under the percentage of completion method favorably impacted income by approximately \$20 in fiscal year 2016, primarily during the fourth quarter. For additional information, see Note 1, Major Accounting Policies (Revenue Recognition).

(B) For additional information, see Note 3, Materials Technologies Separation.

(C) For additional information, see Note 5, Business Restructuring and Cost Reduction Actions.

(D) For additional information, see Note 16, Retirement Benefits.

(E) For additional information, see Note 15, Debt.

(F) Includes income tax expense for tax costs associated with business separation. For additional information, see Note 3, Materials Technologies Separation.

(G) For additional information, see Note 6, Business Combination.

(H) The gain is reflected on the consolidated income statements in Other income (expense), net. For additional information, see Note 24, Supplemental Information.

**Table of Contents****26. BUSINESS SEGMENT AND GEOGRAPHIC INFORMATION**

Our reporting segments reflect the manner in which our chief operating decision maker reviews results and allocates resources. Except in the Corporate and other segment, each reporting segment meets the definition of an operating segment and does not include the aggregation of multiple operating segments. Our liquefied natural gas (LNG) and helium storage and distribution sale of equipment businesses are aggregated within the Corporate and other segment.

Our reporting segments are:

Industrial Gases Americas

Industrial Gases EMEA (Europe, Middle East, and Africa)

Industrial Gases Asia

Industrial Gases Global

Materials Technologies

Corporate and other

**Industrial Gases Regional**

The regional Industrial Gases (Americas, EMEA, Asia) segments include the results of our regional industrial gas businesses, which produce and sell atmospheric gases such as oxygen, nitrogen, and argon (primarily recovered by the cryogenic distillation of air) and process gases such as hydrogen, carbon monoxide, helium, syngas, and specialty gases. We supply gases to customers in many industries, including those in metals, glass, chemical processing, energy production and refining, food processing, metallurgical industries, medical, and general manufacturing. We distribute gases to our customers through a variety of supply modes including liquid or gaseous bulk supply delivered by tanker or tube trailer and, for smaller customers, packaged gases delivered in cylinders and dewars or small on-sites (cryogenic or non-cryogenic generators). For large-volume customers, we construct an on-site plant adjacent to or near the customer's facility or deliver product from one of our pipelines. We are the world's largest provider of hydrogen, which is used by refiners to facilitate the conversion of heavy crude feedstock and lower the sulfur content of gasoline and diesel fuels.

Electricity is the largest cost component in the production of atmospheric gases, and natural gas is the principal raw material for hydrogen, carbon monoxide, and syngas production. We mitigate energy and natural gas prices contractually through pricing formulas, surcharges, and cost pass-through arrangements. The regional Industrial Gases segments also include our share of the results of several joint ventures accounted for by the equity method. The largest of these joint ventures operate in Mexico, Italy, South Africa, India, Saudi Arabia, and Thailand. Each of the regional Industrial Gases segments competes against global industrial gas companies as well as regional competitors. Competition is based primarily on price, reliability of supply, and the development of industrial gas applications. We

derive a competitive advantage in locations where we have pipeline networks, which enable us to provide reliable and economic supply of products to larger customers.

### **Industrial Gases Global**

The Industrial Gases Global segment includes cryogenic and gas processing equipment sales for air separation. The equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery and processing, and steel and primary metals processing. The Industrial Gases Global segment also includes centralized global costs associated with management of all the Industrial Gases segments. These costs include Industrial Gases global administrative costs, product development costs, and research and development costs. We compete with a large number of firms for all the offerings included in the Industrial Gases Global segment. Competition in the equipment businesses is based primarily on technological performance, service, technical know-how, price, and performance guarantees.

### **Materials Technologies**

The Materials Technologies segment, which contains two divisions, Electronic Materials (EMD) and Performance Materials (PMD), employs applications technology to provide solutions to a broad range of global industries through chemical synthesis, analytical technology, process engineering, and surface science. EMD provides specialty gases, specialty chemicals, services, and equipment to the electronics industry, primarily for the manufacture of silicon and compound semiconductors and thin film transistor liquid crystal (LCD) displays. PMD

## **Table of Contents**

provides performance chemical solutions for the coatings, inks, adhesives, construction and civil engineering, personal care, institutional and industrial cleaning, mining, oil refining, and polyurethanes industries. We compete in the businesses included in the Materials Technologies segment on a product-by-product basis against competitors ranging from niche suppliers with a single product to larger and more vertically integrated companies. Competition is principally conducted on the basis of price, quality, product performance, reliability of product supply, technical innovation, service, and global infrastructure.

During 2016, Air Products entered into an agreement to sell certain subsidiaries and assets comprising the PMD division. The sale is subject to regulatory and anti-trust requirements. On 1 October 2016, Air Products completed the separation of its EMD division through the spin-off of Versum. Refer to Note 3, Materials Technologies Separation, for additional information.

## **Corporate and other**

The Corporate and other segment includes two ongoing global businesses (our LNG sale of equipment business and our liquid helium and liquid hydrogen transport and storage container businesses), the polyurethane intermediates (PUI) business that was exited in early fiscal year 2014, and corporate support functions that benefit all the segments. Competition for the two sale of equipment businesses is based primarily on technological performance, service, technical know-how, price, and performance guarantees. Corporate and other also includes income and expense that cannot be directly associated with the business segments, including foreign exchange gains and losses and stranded costs resulting from discontinued operations. Also included are LIFO inventory adjustments, as the business segments use FIFO, and the LIFO pool adjustments are not allocated to the business segments.

In addition to assets of the global businesses included in this segment, other assets include cash, deferred tax assets, and financial instruments.

## **Customers**

We do not have a homogeneous customer base or end market, and no single customer accounts for more than 10% of our consolidated revenues.

## **Accounting Policies**

The accounting policies of the segments are the same as those described in Note 1, Major Accounting Policies. We evaluate the performance of segments based upon reported segment operating income.

**Table of Contents****Business Segment**

	Industrial Gases Americas	Industrial Gases EMEA	Industrial Gases Asia	Industrial Gases Global	Materials Technologies	Corporate and other	Segment Total
<b>2016</b>							
Sales to external customers	\$3,343.6	\$1,700.3	\$1,716.1	\$498.8	\$2,019.5	\$246.1	\$9,524.4
Operating income (loss)	895.2	382.8	449.1	(21.3)	530.2	(37.5)	2,198.5
Depreciation and amortization	442.5	185.7	197.1	7.9	77.4	15.3	925.9
Equity affiliates income (loss)	52.7	36.5	57.8	(.1)	1.7		148.6
Expenditures for long-lived assets	406.6	159.5	313.3	6.0	147.9	22.5	1,055.8
Investments in net assets of and advances to equity affiliates	250.6	580.5	442.5	10.0	4.5		1,288.1
Total assets	5,889.2	3,178.6	4,232.7	367.6	1,787.0	2,580.8	18,035.9
<b>2015</b>							
Sales to external customers	\$3,693.9	\$1,864.9	\$1,637.5	\$286.8	\$2,087.1	\$324.7	\$9,894.9
Operating income (loss)	808.4	330.7	380.5	(51.6)	476.7	(51.5)	1,893.2
Depreciation and amortization	416.9	194.3	202.9	16.5	92.8	13.0	936.4
Equity affiliates income (loss)	64.6	42.4	46.1	(.8)	2.2		154.5
Expenditures for long-lived assets	414.5	215.6	402.5	94.8	102.5	35.7	1,265.6
Investments in net assets of and advances to equity affiliates	249.7	564.1	421.7	14.3	15.9		1,265.7
Total assets	5,774.9	3,323.9	4,154.0	370.5	1,741.9	1,075.7	16,440.9
<b>2014</b>							
Sales to external customers	\$4,078.5	\$2,150.7	\$1,527.0	\$296.0	\$2,064.6	\$322.2	\$10,439.0
Operating income (loss)	762.6	351.2	310.4	(57.3)	379.0	(78.5)	1,667.4
Depreciation and amortization	414.4	220.2	205.3	7.1	99.1	10.8	956.9
Equity affiliates income	60.9	44.1	38.0	5.8	2.6		151.4
Expenditures for long-lived assets	484.2	239.1	430.3	77.7	64.2	67.2	1,362.7
Investments in net assets of and advances to equity affiliates	234.3	552.9	434.1	18.8	17.8		1,257.9
Total assets	6,240.7	3,521.0	4,045.6	389.4	1,835.7	1,044.5	17,076.9

Below is a reconciliation of segment total operating income to consolidated operating income:

<b>Operating Income</b>	<b>2016</b>	2015	2014
Segment total	<b>\$2,198.5</b>	\$1,893.2	\$1,667.4
Business separation costs	<b>(52.2)</b>	(7.5)	



Business restructuring and cost reduction actions	(33.9)	(207.7)	(12.7)
Pension settlement loss	(6.4)	(21.2)	(5.5)
Goodwill and intangible asset impairment charge			(310.1)
Gain on previously held equity interest		17.9	
Gain on land sales <sup>(A)</sup>		33.6	
<b>Consolidated Total</b>	<b>\$2,106.0</b>	<b>\$1,708.3</b>	<b>\$1,339.1</b>

<sup>(A)</sup> Reflected on the consolidated income statements in Other income (expense), net.

Below is a reconciliation of segment total assets to consolidated total assets:

<b>Total Assets</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
Segment total	<b>\$18,035.9</b>	\$16,440.9	\$17,076.9
Discontinued operations	<b>19.4</b>	893.6	591.4
<b>Consolidated Total</b>	<b>\$18,055.3</b>	<b>\$17,334.5</b>	<b>\$17,668.3</b>

The sales information noted above relates to external customers only. All intersegment sales are eliminated in consolidation. The Industrial Gases Global segment had intersegment sales of \$232.4 in 2016, \$242.8 in 2015,

**Table of Contents**

and \$192.4 in 2014. These sales are generally transacted at market pricing. For all other segments, intersegment sales are not material for all periods presented. Equipment manufactured for our regional industrial gases segments are generally transferred at cost and not reflected as an intersegment sale.

**Geographic Information**

<b>Sales to External Customers</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
United States	\$3,792.3	\$4,280.1	\$4,507.6
Canada	225.7	247.1	311.4
Europe	2,505.9	2,315.4	2,628.0
Asia, excluding China	1,382.7	1,395.2	1,389.4
China	1,176.2	1,129.1	981.0
Latin America	441.6	528.0	621.6
<b>Total</b>	<b>\$9,524.4</b>	<b>\$9,894.9</b>	<b>\$10,439.0</b>

  

<b>Long-Lived Assets<sup>(A)</sup></b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
United States	\$3,780.2	\$3,788.5	\$3,754.2
Canada	639.0	577.4	518.0
Europe	1,306.1	1,395.0	1,656.7
Asia, excluding China	1,056.5	914.2	989.9
China	1,721.9	1,732.7	1,582.7
Latin America	349.0	337.3	440.1
<b>Total</b>	<b>\$8,852.7</b>	<b>\$8,745.1</b>	<b>\$8,941.6</b>

<sup>(A)</sup> Long-lived assets include plant and equipment, net.

Geographic information is based on country of origin. Included in United States revenues are export sales to third-party customers of \$307.7 in 2016, \$398.8 in 2015, and \$378.7 in 2014. The Europe region operates principally in France, Germany, the Netherlands, Poland, Saudi Arabia, Spain, and the United Kingdom. The Asia region operates principally in China, Singapore, South Korea, and Taiwan. The Latin America region operates principally in Brazil and Chile.

**Table of Contents**

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

Not applicable

**ITEM 9A. CONTROLS AND PROCEDURES**

Under the supervision of the Chief Executive Officer and Chief Financial Officer, the Company's management conducted an evaluation of the effectiveness of the Company's disclosure controls and procedures as of 30 September 2016. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that, as of the end of the annual period covered by this report, the disclosure controls and procedures have been effective. There has been no change in the Company's internal control over financial reporting (as that term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) as of 30 September 2016 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Management's Report on Internal Control over Financial Reporting is provided under Item 8 appearing above. The report of KPMG LLP, the Company's independent registered public accounting firm, regarding the Company's internal control over financial reporting, is also provided under Item 8 appearing above.

In connection with the spin-off of Versum Materials, Inc., the Company entered into a transition services agreement pursuant to which it will continue to provide information technology, systems applications, business processes, and associated internal controls to Versum for a period of 18 months to allow Versum the time to establish its own infrastructure and both companies sufficient time to physically separate their information technology applications and infrastructure. Management has established controls to mitigate the risk that personnel of either company obtain unauthorized access to the other company's data and will continue to monitor and evaluate the sufficiency of the controls.

**ITEM 9B. OTHER INFORMATION**

Not applicable

**PART III**

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

The information required by this item relating to the Company's directors and nominees is incorporated herein by reference to the section captioned "The Board of Directors" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017. The information required by this item relating to the Company's executive officers is set forth in Item 1 of Part 1 of this report.

The information required by this item relating to the Company's Audit Committee and its Audit Committee Financial Expert is incorporated herein by reference to the sections captioned "Standing Committees Of The Board" and "Audit Committee" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

The information required by this item relating to the Company's procedures regarding the consideration of candidates recommended by shareholders and a procedure for submission of such candidates is incorporated herein by reference

to the section captioned Selection of Directors in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

The information required by the item relating to Section 16(a) Beneficial Ownership Reporting Compliance is incorporated herein by reference to the section captioned Section 16(a) Beneficial Ownership Reporting Compliance in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

The Company has adopted a Code of Conduct that applies to all employees, including the Chief Executive Officer, the Chief Financial Officer, and the Principal Accounting Officer. The Code of Conduct can be found at our Internet website at [www.airproducts.com/codeofconduct](http://www.airproducts.com/codeofconduct).

**Table of Contents****ITEM 11. EXECUTIVE COMPENSATION**

The information required by this item is incorporated herein by reference to the sections captioned "Compensation of Executive Officers" and "Compensation of Directors" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

**ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS****Securities Authorized for Issuance Under Equity Compensation Plans.****Equity Compensation Plan Information**

The following table provides information as of 30 September 2016 about Company stock that may be issued upon the exercise of options, warrants, and rights granted to employees or members of the Board under the Company's existing equity compensation plans, including plans approved by shareholders and plans that have not been approved by shareholders in reliance on the NYSE's former treasury stock exception or other applicable exception to the Exchange's listing requirements.

<b>Plan Category</b>	<b>Number of securities to be issued upon exercise of outstanding options, warrants, and rights</b>	<b>Weighted-average exercise price of outstanding options, warrants, and rights</b>	<b>Number of Securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))</b>
Equity compensation plans approved by security holders	5,070,916 <sup>(1)</sup>	\$90.28	4,840,837 <sup>(2)</sup>
Equity compensation plans not approved by security holders	71,770 <sup>(3)</sup>	\$	
<b>Total</b>	<b>5,142,686</b>	<b>\$90.28</b>	<b>4,840,837</b>

<sup>(1)</sup> Represents Long-Term Incentive Plan outstanding stock options and deferred stock units that have been granted. Deferred stock units entitle the recipient to one share of Company common stock upon vesting, which is conditioned on continued employment during a deferral period and may also be conditioned on earn-out against certain performance targets.

<sup>(2)</sup> Represents authorized shares that were available for future grants as of 30 September 2016. These shares may be used for options, deferred stock units, restricted stock, and other stock-based awards to officers, directors, and key employees. Full value awards such as restricted stock are limited to 20% of cumulative awards after 1 October

2001.

(3) This number represents deferred stock units issued under the Deferred Compensation Plan, which are purchased for the fair market value of the underlying shares of stock with eligible deferred compensation. The Deferred Compensation Plan was not approved by shareholders. It does not require shareholder approval because participants forego compensation equal to the full market value of any share units credited under the plans.

*Deferred Compensation Plan* The Company's Deferred Compensation Plan is an unfunded employee retirement benefit plan available to certain of the Company's U.S.-based management and other highly compensated employees (and those of its subsidiaries) who receive awards under the Company's Annual Incentive Plan, which is the annual cash bonus plan for executives and key salaried employees of the Company and its subsidiaries. Because participants forego current compensation to purchase deferred stock units for full value under the Plan, it is not required to be approved by shareholders under the NYSE listing standards. Under the Plan, participants may defer a portion of base salary (elective deferrals) which cannot be contributed to the Company's Retirement Savings Plan, a 401(k) and profit-sharing plan offered to all salaried employees (RSP), because of tax limitations and earn matching contributions from the Company that they would have received if their elective deferrals had been contributed to the RSP (matching credits). In addition, participants in the Plan may defer all or a portion of their bonus awards under the Annual Incentive Plan (bonus deferrals) under the

## **Table of Contents**

Deferred Compensation Plan. Finally, certain participants under the Plan who participate in the profit-sharing component of the RSP rather than the Company's salaried pension plans receive contribution credits under the Plan which are a percentage ranging from 4%-6%, based on their years of service, of their salary in excess of tax limitations and their bonus awards under the Annual Incentive Plan (contribution credits). The dollar amount of elective deferrals, matching credits, bonus deferrals, and contribution credits is initially credited to an unfunded account, which earns interest credits. Participants are periodically permitted while employed by the Company to irrevocably convert all or a portion of their interest-bearing account to deferred stock units in a Company stock account. Upon conversion, the Company stock account is credited with deferred stock units based on the fair market value of a share of Company stock on the date of crediting. Dividend equivalents corresponding to the number of units are credited quarterly to the interest-bearing account. Deferred stock units generally are paid after termination of employment in shares of Company stock.

The Deferred Compensation Plan was formerly known as the Supplementary Savings Plan. The name was changed in 2006 when the deferred bonus program, previously administered under the Annual Incentive Plan, was merged into this Plan.

Certain information required by this item regarding the beneficial ownership of the Company's common stock is incorporated herein by reference to the sections captioned "Persons Owning More than 5% of Air Products Stock as of September 30, 2016" and "Air Products Stock Beneficially Owned by Officers and Directors" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

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

The information required by this item is incorporated herein by reference to the sections captioned "Director Independence" and "Transactions with Related Persons" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

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

The information required by this item is incorporated herein by reference to the section captioned "Independent Registered Public Accountant" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 26 January 2017.

## **PART IV**

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

(a) The following documents are filed as a part of this report:

- (1) The Company's 2016 consolidated financial statements and the Report of the Independent Registered Public Accounting Firm are included in Part II, Item 8.

- (2) Financial Statement Schedules the following additional information should be read in conjunction with the consolidated financial statements in the Company's 2016 consolidated financial statements.

Schedule II Valuation and Qualifying Accounts for the three fiscal years ended 30 September 2016 121

All other schedules are omitted because the required matter or conditions are not present or because the information required by the Schedules is submitted as part of the consolidated financial statements and notes thereto.

- (3) Exhibits The exhibits filed as a part of this Annual Report on Form 10-K are listed in the Index to Exhibits located on page 122 of this Report.



**Table of Contents**

**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.

AIR PRODUCTS AND CHEMICALS, INC.

(Registrant)

By: /s/ M. Scott Crocco  
M. Scott Crocco

Executive Vice President and Chief Financial Officer

(Principal Financial Officer)

Date: 21 November 2016

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

<b>Signature and Title</b>	<b>Date</b>
/s/ Seifi Ghasemi  (Seifi Ghasemi)  Director, Chairman, President, and  Chief Executive Officer  (Principal Executive Officer)	21 November 2016
/s/ Russell A. Flugel  (Russell A. Flugel)  Vice President and Corporate Controller  (Principal Accounting Officer)	21 November 2016
*  (Susan K. Carter)	21 November 2016

Director

\*

21 November 2016

(Charles I. Cogut)

Director

\*

21 November 2016

(Chad C. Deaton)

Director

\*

21 November 2016

(David H. Y. Ho)

Director

\*

21 November 2016

(Margaret G. McGlynn)

Director

**Table of Contents**

<b>Signature and Title</b>	<b>Date</b>
*  (Edward L. Monser)  Director	21 November 2016
*  (Matthew H. Paull)  Director	21 November 2016

\* Mary T. Afflerbach, Corporate Secretary and Chief Governance Officer, by signing her name hereto, does sign this document on behalf of the above noted individuals, pursuant to a power of attorney duly executed by such individuals, which is filed with the Securities and Exchange Commission herewith.

/s/ Mary T. Afflerbach  
Mary T. Afflerbach  
Attorney-in-Fact

Date: 21 November 2016

**Table of Contents**

SCHEDULE II  
CONSOLIDATED

AIR PRODUCTS AND CHEMICALS, INC. AND SUBSIDIARIES

**SCHEDULE II VALUATION AND QUALIFYING ACCOUNTS**

For the Years Ended 30 September 2016, 2015, and 2014

	Balance at Beginning Period	Additions Charged to Expense	Additions Charged to Other Accounts	Other Changes <sup>(A)</sup>	Balance at End of Period
<b>Year Ended 30 September 2016</b>					
Allowance for doubtful accounts	\$49	\$9	\$14	\$(15)	\$57
Allowance for deferred tax assets <sup>(B)</sup>	104	1	51	(1)	155
<b>Year Ended 30 September 2015</b>					
Allowance for doubtful accounts	\$60	\$8	\$18	\$(37)	\$49
Allowance for deferred tax assets	104		2	(2)	104
<b>Year Ended 30 September 2014</b>					
Allowance for doubtful accounts	\$102	\$8	\$8	\$(58)	\$60
Allowance for deferred tax assets <sup>(C)</sup>	45	58	1		104

(A) Primarily includes write-offs of uncollectible trade receivables. Other Changes also includes the impact of foreign currency translation adjustments.

(B) The increase in the valuation allowance was primarily due to the loss recorded on the exit from the Energy-from-Waste business. These costs were recorded in discontinued operations. See Note 4, Discontinued Operations, for additional information.

(C) The increase in the valuation allowance was primarily due to the capital loss generated from the tax election related to a non-U.S. subsidiary.

**Table of Contents****INDEX TO EXHIBITS**

<b>Exhibit No.</b>	<b>Description</b>
(2)	Plan of acquisition, reorganization, arrangement, liquidation or succession.
2.1	Purchase Agreement dated as of 6 May 2016, by and between Air Products and Chemicals, Inc. and Evonik Industries. (Filed as Exhibit 2.1 to the Company's Form 8-K Report dated 6 May 2016.)
2.2	Separation Agreement dated as of 29 September 2016, by and between Air Products and Chemicals, Inc. and Versum Materials, Inc. (Filed as Exhibit 2.1 to the Company's Form 8-K Report dated 29 September 2016.)
2.3	Tax Matters Agreement dated as of 29 September 2016, by and between Air Products and Chemicals, Inc. and Versum Materials, Inc. (Filed as Exhibit 2.2 to the Company's Form 8-K Report dated 29 September 2016)
(3)	Articles of Incorporation and By-Laws.
3.1	Amended and Restated By-Laws of the Company. (Filed as Exhibit 3.1 to the Company's Form 8-K Report dated 21 November 2014.)*
3.2	Restated Certificate of Incorporation of the Company. (Filed as Exhibit 3.2 to the Company's Form 10-K Report for the fiscal year ended 30 September 1987.)*
3.3	Amendment to the Restated Certificate of Incorporation of the Company dated 25 January 1996. (Filed as Exhibit 3.3 to the Company's Form 10-K Report for the fiscal year ended 30 September 1996.)*
3.4	Amendment to the Restated Certificate of Incorporation of the Company dated 28 January 2014. (Filed as Exhibit 10.2 to the Company's Form 10-Q Report for the quarter ended 30 June 2014.)*
(4)	Instruments defining the rights of security holders, including indentures. Upon request of the Securities and Exchange Commission, the Company hereby undertakes to furnish copies of the instruments with respect to its long-term debt.
4.1	Indenture, dated as of January 18, 1985, between the Company and The Chase Manhattan Bank (National Association), as Trustee. (Filed as Exhibit 4(a) to the Company's Registration Statement No. 33-36974.)*
4.2	Indenture, dated as of January 10, 1995, between the Company and The Bank of New York Trust Company, N.A. (formerly Wachovia Bank, National Association and initially First Fidelity Bank Company, National Association), as Trustee. (Filed as Exhibit 4(a) to the Company's Registration Statement No. 33-57357.)*

- (10) Material Contracts
  - 10.1 1990 Deferred Stock Plan of the Company, as amended and restated effective 1 October 1989. (Filed as Exhibit 10.1 to the Company's Form 10-K Report for the fiscal year ended 30 September 1989.)\*
  - 10.2 Annual Incentive Plan as Amended and Restated Effective 1 October 2008. (Filed as Exhibit 10.7 to the Company's Form 10-Q Report for the quarter ended 31 March 2009.)\*

**Table of Contents**

10.3	Stock Incentive Program of the Company effective 1 October 1996. (Filed as Exhibit 10.21 to the Company's Form 10-K Report for the fiscal year ended 30 September 2002.)*
10.4	Amended and Restated Deferred Compensation Program for Directors, effective 16 July 2015. (Filed as Exhibit 10.7 to the Company's Form 10-K Report for the fiscal year ended 30 September 2015.)*
10.5	Amended and Restated Long-Term Incentive Plan of the Company effective 1 October 2014. (Filed as Exhibit 10.1 to the Company's Form 8-K filed on 23 September 2014.)
10.5(a)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY 2007 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2006.)*
10.5(b)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY 2008 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2007.)*
10.5(c)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY 2009 Awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2008.)*
10.5(d)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2010 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2009.)*
10.5(e)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2011 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2010.)*
10.5(f)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2012 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2011.)*
10.5(g)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2013 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2012.)*
10.5(h)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2014 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2013.)*
10.5(i)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2015 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2014.)*
10.5(j)	Form of Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2016 awards. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 31 December 2015.)*

10.6	Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 January 2016. (Filed as Exhibit 10.2 to the Company's Form 10-Q Report for the quarter ended 31 December 2015)*
------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



**Table of Contents**

10.6(a)	Amendment No. 1 dated as of 30 September 2016 to the Air Products and Chemicals, Inc. Retirement Savings Plan as Amended and Restated effective 1 January 2016.
10.7	Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated Effective August 1, 2014. (Filed as Exhibit 10.10 to the Company's Form 10-K Report for the fiscal year ended 30 September 2014.)*
10.7(a)	Amendment No. 1 dated as of 30 September 2015 to the Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated Effective 1 August 2014. (Filed as Exhibit 10.10(a) to the Company's Form 10-K Report for the fiscal year ended 30 September 2015.)
10.7(b)	Amendment No. 2 dated as of 30 September 2016 to the Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated Effective 1 August 2014.
10.8	Deferred Compensation Plan as Amended and Restated effective 1 August 2014. (Filed as Exhibit 10.11 to the Company's Form 10-K Report for the fiscal year ended 30 September 2014.)*
10.8(a)	Amendment No. 1 dated as of 1 January 2016 to the Deferred Compensation Plan as Amended and Restated effective 1 August 2014. (Filed as Exhibit 10.3 to the Company's Form 10-Q Report for the quarter ended 31 December 2015.)
10.8(b)	Amendment No. 2 dated as of 30 September 2016 to the Deferred Compensation Plan as Amended and Restated effective 1 August 2014.
10.9	Revolving Credit Facility dated as of 30 April 2013 for \$2,500,000,000. (Filed as Exhibit 10.1 to the Company's Form 10-Q Report for the quarter ended 30 June 2013.)*
10.9(a)	Amendment No.1 dated as of 22 July 2013, to the Revolving Credit Agreement dated as of 30 April 2013. (Filed as Exhibit 10.19(a) to the Company's Form 10-K Report for the fiscal year ended 30 September 2013.)*
10.9(b)	Amendment No. 2 dated as of 30 June 2014, to the Revolving Credit Agreement dated as of 30 April 2013. (Filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended 30 June 2014)*
10.9(c)	Amendment No. 3 dated as of 30 April 2015, to the Revolving Credit Agreement dated as of 30 April 2013. (Filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended 30 June 2015)*
10.9(d)	Amendment No. 4 dated as of 30 September 2015, to the Revolving Credit Agreement dated as of 30 April 2013. (Filed as Exhibit 10.12(d) to the Company's Form 10-K Report for the fiscal year ended 30 September 2015.)
10.9(e)	Amendment No. 5 dated 9 June 2016, to the Revolving Credit Agreement dated as of 30 April 2013. (Filed as Exhibit 10.1 to the Company's Form 10-Q for the quarter ended 30 June 2016.)
10.10	Air Products and Chemicals, Inc. Executive Separation Program as amended effective as of 20 May 2015. (Filed as Exhibit 10.2 to the Company's Form 10-Q for the quarter ended 30 June 2015.)*
10.11	

Form of Change in Control Severance Agreement for an Executive Officer. (Filed as Exhibit 10.21 to the Company's Form 10-K Report for the fiscal year ended 30 September 2011.)\*

**Table of Contents**

10.12	Compensation Program for Directors effective 1 October 2013. (Filed as Exhibit 10.19(a) to the Company's Form 10-K Report for the fiscal year ended 30 September 2013)*
10.13	Air Products and Chemicals, Inc. Corporate Executive Committee Retention Agreements effective as of 10 January 2014. (Filed as Exhibit 10.1 to the Company's Form 8-K Report dated 15 January 2014.)*
10.14	Employment Agreement for an Executive Officer. (Filed as Exhibit 10.1 to the Company's Form 8-K filed on 18 June 2014)*
10.15	Retirement and Retention Agreement for an Executive Officer.
10.16	Senior Management Severance and Summary Plan Description effective as of 1 April 2016.
12	Computation of Ratios of Earnings to Fixed Charges.
14	Code of Conduct revised on 17 May 2012. (Filed as Exhibit 14 to the Company's Form 8-K Report filed on 23 May 2012.)*
21	Subsidiaries of the registrant.
(23)	Consents of Experts and Counsel.
23.1	Consent of Independent Registered Public Accounting Firm.
24	Power of Attorney.
(31)	Rule 13a-14(a)/15d-14(a) Certifications.
31.1	Certification by the Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification by the Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
(32)	Section 1350 Certifications.
32.1	Certification by the Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
99.1	Description of Common Stock (Filed as Exhibit 99.1 to the Company's Form 10-K Report for the fiscal year ended 30 September 2014.)*
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema

101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase

**Table of Contents**

101.PRE XBRL Taxonomy Extension Presentation Linkbase

101.DEF XBRL Taxonomy Extension Definition Linkbase

\* Previously filed as indicated and incorporated herein by reference. Exhibits incorporated by reference are located in SEC File No. 1-4534.

The certification attached as Exhibit 32.1 that accompanies this Annual Report on Form 10-K, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Air Products and Chemicals, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Form 10-K, irrespective of any general incorporation language contained in such filing.