

PPG INDUSTRIES INC
 Form 10-K
 February 16, 2017

UNITED STATES
 SECURITIES AND EXCHANGE COMMISSION
 WASHINGTON, D.C. 20549

FORM 10-K
 ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF
 THE SECURITIES EXCHANGE ACT OF 1934
 For the fiscal year ended December 31, 2016 Commission File Number 1-1687
 PPG INDUSTRIES, INC.

(Exact name of registrant as specified in its charter)

Pennsylvania

25-0730780

(State or other jurisdiction of incorporation or organization)

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

One PPG Place, Pittsburgh, Pennsylvania

15272

(Address of principal executive offices)

(Zip code)

Registrant's telephone number, including area code:

412-434-3131

Securities Registered Pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock – Par Value \$1.66 ² / ₃	New York Stock Exchange
0.000% Notes due 2019	New York Stock Exchange
0.875% Notes due 2022	New York Stock Exchange
0.875% Notes due 2025	New York Stock Exchange
1.400% Notes due 2027	New York Stock Exchange

Securities Registered Pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer as defined in Rule 405 of the Securities Act. YES NO

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

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

Indicate by checkmark 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 is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Large accelerated filer

Accelerated filer

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Non-accelerated filer

Smaller reporting company

(Do not check if a smaller reporting company)

Indicate by check mark whether the Registrant is a shell company (as defined by Rule 12b-2 of the Act). YES NO

The aggregate market value of common stock held by non-affiliates as of June 30, 2016, was \$27,771 million. As of January 31, 2017, 257,094,500 shares of the Registrant's common stock, with a par value of \$1.66²/₃ per share, were outstanding. As of that date, the aggregate market value of common stock held by non-affiliates was \$25,682 million.

DOCUMENTS INCORPORATED BY REFERENCE

Document	Incorporated By Reference In Part No.
Portions of PPG Industries, Inc. Proxy Statement for its 2017 Annual Meeting of Shareholders	III

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PPG INDUSTRIES, INC.
AND CONSOLIDATED SUBSIDIARIES

As used in this report, the terms “PPG,” “Company,” “Registrant,” “we,” “us” and “our” refer to PPG Industries, Inc., and its subsidiaries, taken as a whole, unless the context indicates otherwise.

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Note on Incorporation by Reference

Throughout this report, various information and data are incorporated by reference from the Company’s 2016 Annual Report (hereinafter referred to as “the Annual Report”). Any reference in this report to disclosures in the Annual Report shall constitute incorporation by reference only of that specific information and data into this Form 10-K.

Part I

Item 1. Business

PPG Industries, Inc., manufactures and distributes a broad range of coatings and specialty materials. PPG was incorporated in Pennsylvania in 1883.

PPG's vision is to be the world's leading coatings company by consistently delivering high-quality, innovative and sustainable solutions that customers trust to protect and beautify their products and surroundings.

PPG's business is comprised of three reportable business segments: Performance Coatings, Industrial Coatings and Glass.

In October 2016, PPG completed the sale of its flat glass business. As such, all historical information has been recast to present the flat glass business as discontinued operations and assets held for sale. Refer to Note 2, "Acquisitions and Divestitures" under Item 8 of this Form 10-K for further information relating to this transaction.

Performance Coatings and Industrial Coatings

PPG is a major global supplier of coatings. The Performance Coatings and Industrial Coatings reportable segments supply coatings and specialty materials for customers in a wide array of end-use markets, including industrial equipment and components, packaging material; aircraft and marine equipment; automotive original equipment ("automotive OEM"); as well as for other industrial and consumer products. In addition to supplying coatings to the automotive OEM market, PPG supplies refinishes to the automotive aftermarket. PPG also serves commercial and residential new build and maintenance markets by supplying coatings to painting and maintenance contractors and directly to consumers for decoration and maintenance. The coatings industry is highly competitive and consists of several large firms with global presence and many smaller firms serving local or regional markets. PPG competes in its primary markets with the world's largest coatings companies, most of which have global operations, and many smaller regional coatings companies.

Performance Coatings

The Performance Coatings reportable segment is comprised of the refinish, aerospace, protective and marine, architectural – Americas and Asia Pacific and architectural – EMEA coatings businesses.

The refinish coatings business supplies coatings products for automotive and commercial transport/fleet repair and refurbishing, light industrial coatings and specialty coatings for signs. These products are sold primarily through independent distributors.

The aerospace coatings business supplies coatings, sealants and transparencies for commercial, military, regional jet and general aviation aircraft, and transparent armor for specialty applications and provides chemical management services for the aerospace industry. PPG supplies products to aircraft manufacturers and maintenance and aftermarket customers around the world both on a direct basis and through a company-owned distribution network.

The protective and marine coatings business supplies coatings and finishes for the protection of metals and structures to metal fabricators, heavy duty maintenance contractors and

manufacturers of ships, bridges and rail cars. These products are sold through company-owned architectural coatings stores, independent distributors and directly to customers.

The architectural coatings-Americas and Asia Pacific business primarily produces coatings used by painting and maintenance contractors and by consumers for decoration and maintenance of residential and commercial building structures. These coatings are sold under a number of brands, including PPG®, GLIDDEN®, COMEX®, OLYMPIC®, DULUX® (in Canada), SIKKENS®, PPG PITTSBURGH PAINTS®, MULCO®, FLOOD®, LIQUID NAILS®, SICO®, CIL®, RENNER®, TAUBMANS®, WHITE KNIGHT®, BRISTOL®, and HOMAX®. Architectural coatings – Americas and Asia Pacific products are sold through a combination of company-owned stores, home centers and other regional or national consumer retail outlets, paint dealers, concessionaires, independent distributors and directly to customers. At the end of 2016, the architectural coatings-Americas and Asia Pacific business operated about 920 company-owned stores in North America, about 40 company-owned stores in Australia and about 75 company-owned stores in Central America. In addition, PPG sells coatings and related products through more than 4,200 stores that are independently owned and operated by approximately 700 concessionaires, primarily in Mexico.

The architectural coatings – EMEA business supplies a variety of coatings and purchased sundries to painting contractors and consumers in Europe, the Middle East and Africa. The coatings are sold under a number of brands,

including SIGMA[®], HISTOR[®], SEIGNEURIE[®], GUITTET[®], PEINTURES GAUTHIER[®], RIPOLIN[®], JOHNSTONE'S[®], LEYLAND[®], PRIMALEX[®], DEKORAL[®], TRILAK[®], PROMINENT PAINTS[®], GORI[®], and BONDEX[®]. Architectural coatings – EMEA products are sold through a combination of about 690 company-owned stores, regional home centers, paint dealers, and independent distributors and directly to customers.

Price, product performance, technology, quality, distribution, brand recognition and technical and customer service are major competitive factors in the performance coatings businesses.

The major global competitors of the Performance Coatings reportable segment are Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Benjamin Moore, Hempel A/S, the Jotun Group, Masco Corporation, Materis Paints, Nippon Paint; RPM International Inc, the Sherwin-Williams Company, and Valspar Corporation. The average number of persons employed by the Performance Coatings reportable segment during 2016 was about 28,400.

Industrial Coatings

The Industrial Coatings reportable segment is comprised of the automotive OEM, industrial coatings, packaging coatings, coatings services and specialty coatings and materials businesses. Industrial, automotive OEM, packaging coatings, and specialty coatings and materials products are formulated specifically for the customers' needs and application methods.

The industrial and automotive OEM coatings businesses sell directly to a variety of manufacturing companies. PPG also supplies adhesives and sealants for the automotive industry and metal pretreatments and related chemicals for industrial and automotive applications. PPG's industrial coatings business

produces coatings for appliances, agricultural and construction equipment, consumer electronics, automotive parts and accessories, building products (including residential and commercial construction), transportation vehicles and numerous other finished products. PPG's automotive OEM coatings business was the first to introduce breakthrough automotive coating technologies such as cathodic electrocoat, powder clearcoat, compact paint systems and factory-applied spray-in bedliners, and the Company has a continued focus on innovation leadership. PPG has established alliances with Kansai Paints to serve Japanese-based automotive OEM customers in North America and Europe and Asian Paints Ltd. to serve certain aftermarket customers and automotive OEMs in India.

The packaging coatings business supplies coatings to a variety of manufacturing companies. Packaging coatings are widely used for the protection, performance and decoration of metal cans, closures, plastic tubes, industrial packaging, and promotional and specialty packaging.

The coatings services business applies coatings to customers' manufactured parts and assembled products. It operates on-site coatings services within several customer manufacturing locations, as well as at regional service centers.

Customers ship parts to service centers where they are treated to enhance paint adhesion and painted with electrocoat, powder or liquid coatings technologies. Coated parts are then shipped to the customer's next stage of assembly.

Price, product performance, technology, cost effectiveness, quality and technical and customer service are major competitive factors in the industrial, automotive OEM, packaging coatings, and coatings services businesses.

The primary specialty coatings and materials products are amorphous precipitated silicas for tire, battery separator and other end-use markets; TESLIN[®] substrate used in such applications as radio frequency identification (RFID) tags and labels, e-passports, drivers' licenses and identification cards; Organic Light Emitting Diode (OLED) materials for use in displays and lighting; optical lens materials and photochromic dyes for optical lenses and color-change products. Product quality and performance, distribution and technical service are the most critical competitive factors to the specialty coatings and materials business.

The major global competitors of the Industrial Coatings reportable segment are Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Kansai Paints, Nippon Paint and Valspar Corporation. The average number of persons employed by the Industrial Coatings reportable segment during 2016 was about 13,400.

Glass

The Glass reportable segment is comprised of the North American fiber glass business. During 2016, PPG divested its European fiber glass business and its ownership interest in two Asian fiber glass joint ventures. Refer to Note 2, "Acquisitions and Divestitures" under Item 8 of this Form 10-K for further information relating to these transactions. PPG's major fiber glass markets are commercial and residential construction and the wind energy, energy infrastructure, transportation and electronics industries. Most fiber glass products are sold directly to manufacturing companies. PPG manufactures fiber glass by the continuous-strand process.

Price, quality, technology and customer service are the key competitive factors in the North American fiber glass business. The Company competes with many major producers of fiber glass, including CPIC Fiberglass, Johns Manville Corporation, Jushi Group, Owens Corning and Taishan Fiberglass.

Excluding divested businesses, the average number of persons employed by the Glass reportable segment during 2016 was about 1,100.

Strategic Acquisitions

Since the filing of our 2015 Form 10-K, the Performance Coatings and Industrial Coatings segments announced and completed several strategic acquisitions, as follows:

Performance Coatings

On January 20, 2017, PPG acquired certain assets of automotive refinish coatings company Futian Xinshi (Futian), based in the Guangdong province of China. Futian distributes its products in China through a network of more than 200 distributors. Futian had sales of approximately \$15 million in 2016.

On January 5, 2017, PPG completed the acquisition of DEUTEK S.A., a leading Romanian paint and architectural coatings manufacturer, from the Emerging Europe Accession Fund. DEUTEK, established in 1993, manufactures and markets a large portfolio of well-known professional and consumer paint brands, including OSKAR and Danke!. The company's products are sold in more than 120 do-it-yourself stores and 3,500 independent retail outlets in Romania. DEUTEK reported sales of 30 million euros in 2015.

On November 11, 2016, PPG purchased the 50% ownership interest in PPG Univer S.p.A from its joint-venture partner, Univer Italiana S.r.l. PPG Univer S.p.A manufactures architectural and liquid industrial coatings employs about 150 people. It operates a network of 12 retail stores in Italy and maintains administrative offices and a production facility in the town of Cavallirio, Italy. PPG Univer S.p.A. had sales of approximately 30 million euros in 2016.

Industrial Coatings

In July 2016, PPG completed the acquisition of MetoKote Corporation. MetoKote is a U.S.-based coatings services business with 2015 global sales of approximately \$200 million. MetoKote applies coatings to customers' manufactured parts and assembled products. It operates on-site coatings services within several customer manufacturing locations, as well as at regional service centers, located throughout the U.S., Canada, Mexico, the United Kingdom, Germany, Hungary and the Czech Republic. Customers ship parts to MetoKote service centers where they are treated to enhance paint adhesion and painted with electrocoat, powder or liquid coatings technologies. MetoKote coats an average of more than 1.5 million parts per day. Beginning in July 2016, the financial results of MetoKote are reported as the coatings services operating segment.

Raw Materials and Energy

The effective management of raw materials and energy is important to PPG's continued success. The Company's most significant raw materials are epoxy and other resins, titanium dioxide and other pigments, and solvents in the coatings businesses; sand and soda ash for the specialty coatings and materials business; and sand and clay in the North American

fiber glass business. Coatings raw materials, which include both organic, primarily petroleum based, materials and inorganic materials, including titanium dioxide, comprise between 70% and 80% of the Company's cost of sales, excluding depreciation and amortization, in most coatings formulations and represent PPG's single largest production cost component.

Most of the raw materials and energy used in production are purchased from outside sources, and the Company has made, and plans to continue to make, supply arrangements to meet the planned operating requirements for the future. Supply of critical raw materials and energy is managed by establishing contracts, multiple sources, and identifying alternative materials or technology whenever possible. Our products use both petroleum-derived and bio-based materials as part of a product renewal strategy. While prices for these raw materials typically fluctuate with energy prices, such fluctuations are impacted by the fact that the manufacture of our raw materials is several steps downstream from crude oil and natural gas.

The Company is continuing its aggressive sourcing initiatives to broaden our supply of high quality raw materials. These initiatives include qualifying multiple and local sources of supply, including suppliers from Asia and other lower cost regions of the world, adding on-site resin production at certain manufacturing locations and a reduction in the amount of titanium dioxide used in our product formulations.

Our global efforts to reduce titanium dioxide consumption have been successful to date and are expected to continue. Titanium dioxide is a raw material widely used in the paint and coatings industry as a pigment to provide hiding, durability and whiteness characteristics. PPG purchases both sulfate-grade and chloride-grade titanium dioxide from suppliers for use in coatings formulations. The Company has undertaken a strategic initiative to secure and enhance PPG's supply of titanium dioxide, as well as to minimize PPG's use of this raw material. PPG possesses intellectual property and expertise in the production and finishing of titanium dioxide pigment. PPG intends to continue to leverage this technology and intends to develop innovative supply solutions through technical collaborations, joint ventures and licensing arrangements with other interested parties.

PPG signed a license agreement with Henan Billions Chemicals Co., Ltd. ("Billions"), under which PPG has licensed certain chloride-based titanium dioxide technologies for use at Billions' titanium dioxide refinement facilities in China. In addition, PPG has signed long-term purchase agreements for chloride-grade and sulfate-grade titanium dioxide with Billions. In late 2015, PPG began using chloride-grade titanium dioxide produced by Billions using PPG's licensed chloride-based technology. PPG's usage of Billions' chloride-grade titanium dioxide increased in 2016. PPG is using the chloride-grade titanium dioxide to produce standard grades of coatings products. Under the license agreement, Billions has the right to sell chloride-based titanium dioxide to other parties.

We are subject to existing and evolving standards relating to the registration of chemicals which could potentially impact the availability and viability of some of the raw materials we use in our production processes. Our ongoing global product stewardship efforts are directed at maintaining our compliance with these standards.

Changes to chemical registration regulations have been proposed or implemented in the EU and many other countries, including China, Canada, the United States, and Korea. Because implementation of many of these programs has not been finalized, the financial impact cannot be estimated at this time. We anticipate that the number of chemical registration regulations will continue to increase globally, and we have implemented programs to track and comply with these regulations.

Given the recent volatility in certain energy-based input costs and foreign currencies, the Company is not able to predict with certainty the 2017 full year impact of related changes in raw material pricing; however, PPG currently expects overall coatings raw material prices to increase modestly in 2017, with impacts varied by region and commodity. Further, given the distribution nature of many of our businesses, logistics and distribution costs are sizable, as are wages and benefits but to a lesser degree. In aggregate, raw material feedstock prices in 2016 were lower, including oil-related products, although some products experienced price inflation late in the year. Since oil is traded in U.S. dollars globally, the strengthening of the dollar against a wide variety of foreign currencies reduced some of the oil-related benefits in certain regions, and in certain cases resulted in inflationary raw material prices.

Research and Development

Technology innovation has been a hallmark of PPG's success throughout its history. Research and development costs, including depreciation of research facilities, were \$487 million, \$494 million and \$499 million during 2016, 2015 and

2014, respectively, and totaled approximately 3% of annual sales in each year. We have obtained government funding for a small portion of the Company's research efforts, and we will continue to pursue government funding where appropriate.

PPG owns and operates several facilities to conduct research and development relating to new and improved products and processes. In addition to the Company's centralized principal research and development centers (See Item 2 of this Form 10-K), operating segments manage their development through centers of excellence. As part of our ongoing efforts to manage our formulations and raw material costs effectively, we operate a global competitive sourcing laboratory in China. Because of the Company's broad array of products and customers, PPG is not materially dependent upon any single technology platform.

The Company seeks to optimize its investment in research and development to create new products to drive profitable growth. We align our product development with the macro trends in the end-use markets we serve and leverage core technology platforms to develop products for unmet market needs. Our history of successful technology introductions is based on a commitment to an efficient and effective innovation process and disciplined portfolio management.

Patents

PPG considers patent protection to be important; however, the Company's reportable business segments are not materially dependent upon any single patent or group of related patents. PPG earned \$15 million, \$20 million and \$29 million in 2016, 2015 and 2014, respectively, from royalties and the sale of technical know-how.

Backlog

In general, PPG does not manufacture its products against a backlog of orders. Production and inventory levels are geared primarily to projections of future demand and the level of incoming orders.

Global Operations

PPG has a significant investment in non-U.S. operations. This broad geographic footprint serves to lessen the significance of economic impacts occurring in any one region on PPG's total net sales and income from continuing operations. As a result of our expansion outside the U.S., we are subject to certain inherent risks, including economic and political conditions in international markets and fluctuations in foreign currency exchange rates. During 2016, unfavorable foreign currency reduced net sales by approximately \$400 million.

Our net sales in the developed and emerging regions of the world for the years ended December 31st are summarized below:

(\$ in millions)	Net Sales		
	2016	2015	2014
United States, Canada, Western Europe	\$10,196	\$10,145	\$10,657
Latin America, Central and Eastern Europe, Middle East, Africa, Asia Pacific	4,555	4,621	4,134
Total	\$14,751	\$14,766	\$14,791

Refer to Note 19, "Reportable Business Segment Information" under Item 8 of this Form 10-K for geographic information related to PPG's property, plant and equipment, and for additional geographic information pertaining to sales.

Seasonality

PPG's income from continuing operations has typically been greater in the second and third quarters and cash from operating activities has been greatest in the fourth quarter due to end-use market seasonality, primarily in PPG's architectural coatings businesses. Demand for PPG's architectural coatings products is typically the strongest in the second and third quarters due to higher home improvement, maintenance and construction activity during the spring and summer months in the U.S. and Canada and Europe. The Latin America paint season is the strongest in the fourth quarter. These higher activity levels result in higher outstanding receivables that are collected in the fourth quarter generating higher fourth quarter cash from operating activities.

Employee Relations

The average number of persons employed worldwide by PPG during 2016 was about 47,000. The Company has numerous collective bargaining agreements throughout the world. We observe local customs, laws and practices in labor relations when negotiating collective bargaining agreements. There were no significant work stoppages in 2016. While we have experienced occasional work stoppages as a result of the collective bargaining process and may experience some work stoppages in the future, we believe that we will be able to negotiate all labor agreements on satisfactory terms. To date, these work stoppages have not had a significant impact on PPG's results of operations. Overall, the Company believes it has good relationships with its employees.

Environmental Matters

PPG is subject to existing and evolving standards relating to protection of the environment. PPG is negotiating with various government agencies concerning 126 current and former manufacturing sites and offsite waste disposal locations, including 24 sites on the National Priority List. While PPG is not generally a major contributor of wastes to these offsite waste disposal locations, each potentially responsible party may face governmental agency assertions of joint and several liability. Generally, however, a final allocation of costs is made based on relative contributions of wastes to the site. There is a wide range of cost estimates for cleanup of these sites, due largely to uncertainties as to the nature and extent of their condition and the methods that may have to be employed for their remediation. The Company has established reserves for onsite and offsite remediation of those sites where it is probable that a liability has been incurred and the amount of loss can be reasonably estimated.

The Company's experience to date regarding environmental matters leads it to believe that it will have continuing expenditures for compliance with provisions regulating the protection of the environment and for present and future remediation efforts at waste and plant sites. Management anticipates that such expenditures will occur over an extended period of time.

In addition to the \$285 million currently reserved for environmental remediation efforts, we may be subject to loss contingencies related to environmental matters estimated to be approximately \$100 million to \$200 million. These reasonably possible unreserved losses relate to environmental matters at a number of sites, none of which are individually significant. The loss contingencies related to these sites include significant unresolved issues such as the nature and extent of contamination at these sites and the methods that may have to be employed to remediate them. Capital expenditures for environmental control projects were \$18 million, \$15 million and \$14 million in 2016, 2015, and 2014, respectively. It is expected that expenditures for such projects in 2017 will be in the range of \$10 million to \$20 million. Although future capital expenditures are difficult to estimate accurately because of constantly changing regulatory standards and policies, it can be anticipated that environmental control standards will become increasingly stringent and the cost of compliance will increase.

In management's opinion, the Company operates in an environmentally sound manner, is well positioned, relative to environmental matters, within the industries in which it operates and the outcome of these environmental contingencies will not have a material adverse effect on PPG's financial position or liquidity; however, any such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. See Note 13, "Commitments and Contingent Liabilities," under Item 8 of this Form 10-K for additional information related to environmental matters and our accrued liability for estimated environmental remediation costs. Public and governmental concerns related to climate change continue to grow, leading to efforts to limit the greenhouse gas ("GHG") emissions believed to be responsible. While PPG has operations in many countries, a substantial portion of PPG's

GHG emissions are generated by locations in the U.S., where considerable legislative and regulatory activity has been taking place. PPG has, and will continue to, annually report our global GHG emissions to the voluntary Carbon Disclosure project.

Since PPG's GHG emissions arise principally from combustion of fossil fuels and the purchase of electricity, PPG has for some time recognized the desirability of reducing energy consumption and GHG generation. For the three year period ended December 31, 2016, including the flat glass facilities divested October 1, 2016, energy consumption intensity was reduced by 30% and GHG emission generation intensity was reduced by 22%.

PPG participates in both the U.S. Department of Energy, BETTER BUILDINGS®, BETTER PLANTS® program, formerly the SAVE ENERGY NOW® Leadership program, and the Environmental Protection Agency ENERGY STAR® Industrial Partnership program, both reinforcing the company's voluntary efforts to significantly reduce its industrial energy intensity. These programs include developing and implementing energy management processes and setting energy savings targets while providing a suite of educational, training, and technical resources to help meet those targets. Recognizing the continuing importance of this matter, PPG has a senior management group with a mandate to guide the Company's progress in this area.

PPG's public disclosure on energy security and climate change can be viewed in our Sustainability Report at sustainability.ppg.com or at the Carbon Disclosure Project www.cdp.net.

Available Information

The Company's website address is www.ppg.com. The Company posts, and shareholders may access without charge, the Company's recent filings and any amendments thereto of its annual reports on Form 10-K, quarterly reports on Form 10-Q and its proxy statements as soon as reasonably practicable after such reports are filed with the Securities and Exchange Commission ("SEC"). The Company also posts all financial press releases, including earnings releases, to its website. All other reports filed or furnished to the SEC, including reports on Form 8-K, are available via direct link on PPG's website to the SEC's website, www.sec.gov. Reference to the Company's and the SEC's websites herein does not incorporate by reference any information contained on those websites and such information should not be considered part of this Form 10-K.

Item 1A. Risk Factors

As a global manufacturer of coatings, specialty materials and fiber glass products, we operate in a business environment that includes risks. These risks are not unlike the risks we have faced in the recent past nor are they unlike risks faced by our competitors. Each of the risks described in this section could adversely affect our results of operations, financial position and liquidity. While the factors listed here are considered to be the more significant factors, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles which may adversely affect our businesses and our results of operations.

Increases in prices and declines in the availability of raw materials could negatively impact our financial results. Our financial results are significantly affected by the cost of raw materials. Coatings raw materials, which include both organic, primarily petroleum based, materials and inorganic materials, including titanium dioxide, comprise between 70% and 80% of the Company's cost of sales, exclusive of depreciation and amortization, sold in most coatings formulations and represent PPG's single largest production cost component.

While not our customary practice, we also import raw materials and intermediates, particularly for use at our manufacturing facilities in the emerging regions of the world. In most cases, those imports are priced in the currency of the supplier and, therefore, if that currency strengthens against the currency of our manufacturing facility, our margins may be lower.

Most of our raw materials are purchased from outside sources, and the Company has made, and plans to continue to make, supply arrangements to meet the planned operating requirements for the future. Adequate supply of critical raw materials is managed by establishing contracts, procuring from multiple sources, and identifying alternative materials or technology whenever possible. The Company is continuing its aggressive sourcing initiatives to effectively broaden our supply of high quality raw materials. These initiatives include qualifying multiple and local sources of supply, including suppliers from Asia and other lower cost regions of the world, adding on-site resin production at certain manufacturing locations, and a reduction in the amount of titanium dioxide and other raw materials used in our

product formulations. Our products use both petroleum-derived and bio-based materials as part of a product renewal strategy.

An inability to obtain critical raw materials would adversely impact our ability to produce products. Increases in the cost of raw materials may have an adverse effect on our income from continuing operations or cash from operating activities in the event we are unable to offset these higher costs in a timely manner.

The pace of economic growth and level of uncertainty could have a negative impact on our results of operations and cash flows.

During 2016, overall economic conditions remained mixed among the major global economies. PPG provides products and services to a variety of end-use markets in many geographies. This broad end-use market exposure and expanded geographic presence lessens the significance of any individual decrease in activity levels; nonetheless, lower demand levels may result in lower sales, which would result in reduced income from continuing operations and cash from operating activities.

Refer to Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" of this Form 10-K for discussion of the economic conditions in 2016 and our outlook on certain economic conditions in 2017.

We are subject to existing and evolving standards relating to the protection of the environment.

Environmental laws and regulations control, among other things, the discharge of pollutants into the air and water, the

handling, use, treatment, storage and clean-up of hazardous and non-hazardous waste, the investigation and remediation of soil and groundwater affected by hazardous substances, and regulate various health and safety matters. The environmental laws and regulations we are subject to impose liability for the costs of, and damages resulting from, cleaning up current sites, past spills, disposals and other releases of hazardous substances. Violations of these laws and regulations can also result in fines and penalties. Future environmental laws and regulations may require substantial capital expenditures or may require or cause us to modify or curtail our operations, which may have a material adverse impact on our business, financial condition and results of operations.

As described in Note 13, “Commitments and Contingent Liabilities,” under Item 8 of this Form 10-K, we are currently undertaking environmental remediation activities at a number of our current and former facilities and properties, the cost of which is substantial. In addition to the amounts currently reserved, we may be subject to loss contingencies related to environmental matters estimated to be as much as \$100 million to \$200 million. Such unreserved losses are reasonably possible but are not currently considered to be probable of occurrence.

We are involved in a number of lawsuits and claims, and we may be involved in future lawsuits and claims, in which substantial monetary damages are sought.

PPG is involved in a number of lawsuits and claims, both actual and potential, in which substantial monetary damages are sought. Those lawsuits and claims relate to contract, patent, environmental, product liability, asbestos exposure, antitrust, employment and other matters arising out of the conduct of PPG’s current and past business activities. Any such claims, whether with or without merit, could be time consuming, expensive to defend and could divert management’s attention and resources. We maintain insurance against some, but not all, of these potential claims, and the levels of insurance we do maintain may not be adequate to fully cover any and all losses. We believe that, in the aggregate, the outcome of all current lawsuits and claims involving PPG, including those described in Note 13, “Commitments and Contingent Liabilities” under Item 8 of this Form 10-K, will not have a material effect on PPG’s consolidated financial position or liquidity; however, such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Nonetheless, the results of any future litigation or claims are inherently unpredictable, but such outcomes could have a material adverse effect on our results of operations, cash from operating activities or financial condition.

Fluctuations in foreign currency exchange rates could affect our financial results.

We earn revenues, pay expenses, own assets and incur liabilities in countries using currencies other than the U.S. dollar. Because our consolidated financial statements are presented in U.S. dollars, we must translate revenues and expenses into U.S. dollars at the average exchange rate during each reporting period, as well as assets and liabilities into U.S. dollars at exchange rates in effect at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. dollar against other currencies will affect our net sales, net income and the value of balance sheet items denominated in foreign

currencies. We may use derivative financial instruments to reduce our net exposure to currency exchange rate fluctuations related to foreign currency transactions. However, fluctuations in foreign currency exchange rates, particularly the strengthening of the U.S. dollar against major currencies, could adversely affect our financial condition and results of operations expressed in U.S. dollars. In 2016, this U.S. dollar strengthening had an unfavorable impact on full year net sales and income before income taxes from the translation of foreign earnings into U.S. dollars of approximately \$400 million and \$70 million, respectively.

We are subject to a variety of complex U.S. and non-U.S. laws and regulations which could increase our compliance costs.

We are subject to a wide variety of complex U.S. and non-U.S. laws and regulations, and legal compliance risks, including securities laws, tax laws, environmental laws, employment and pension-related laws, competition laws, U.S. and foreign export and trading laws, a