

PPG INDUSTRIES INC
Form 10-Q
July 22, 2016
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

QUARTERLY REPORT UNDER SECTION 13 or 15(d) OF
THE SECURITIES EXCHANGE ACT OF 1934
For Quarter Ended June 30, 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)
(412) 434-3131
(Registrant's telephone number, including area code)

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

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

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

Large accelerated filer Accelerated filer
Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company

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

As of June 30, 2016, 266,282,301 shares of the Registrant's common stock, par value \$1.66-2/3 per share, were outstanding.

PPG INDUSTRIES, INC. AND SUBSIDIARIES
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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

PPG INDUSTRIES, INC. AND SUBSIDIARIES

Condensed Consolidated Statement of Income (Unaudited)

(\$ in millions, except per share amounts)

	Three Months Ended June 30		Six Months Ended June 30	
	2016	2015	2016	2015
Net sales	\$4,064	\$4,100	\$7,736	\$7,762
Cost of sales, exclusive of depreciation and amortization	2,190	2,283	4,203	4,348
Selling, general and administrative	956	954	1,875	1,867
Depreciation	91	92	182	179
Amortization	30	33	60	66
Research and development, net	119	123	237	242
Interest expense	31	34	62	63
Interest income	(7)	(10)	(14)	(21)
Business restructuring	—	140	—	140
Asbestos settlement, net	2	3	5	6
Other charges	32	34	53	59
Other income	(53)	(38)	(71)	(69)
Income from continuing operations before income taxes	673	452	1,144	882
Income tax expense	297	110	414	214
Income from continuing operations	376	342	730	668
Income from discontinued operations, net of tax	—	—	—	1
Net income attributable to the controlling and noncontrolling interests	376	342	730	669
Less: Net income attributable to noncontrolling interests	(6)	(5)	(13)	(10)
Net income (attributable to PPG)	\$370	\$337	\$717	\$659
Amounts attributable to PPG:				
Income from continuing operations, net of tax	\$370	\$337	\$717	\$658
Income from discontinued operations, net of tax	—	—	—	1
Net income (attributable to PPG)	\$370	\$337	\$717	\$659
Earnings per common share:				
Income from continuing operations, net of tax	\$1.38	\$1.24	\$2.68	\$2.41
Income from discontinued operations, net of tax	—	—	—	0.01
Net income (attributable to PPG)	\$1.38	\$1.24	\$2.68	\$2.42
Earnings per common share – assuming dilution:				
Income from continuing operations, net of tax	\$1.37	\$1.23	\$2.66	\$2.39
Income from discontinued operations, net of tax	—	—	—	0.01
Net income (attributable to PPG)	\$1.37	\$1.23	\$2.66	\$2.40
Dividends per common share	\$0.40	\$0.36	\$0.76	\$0.69

The accompanying notes to the condensed consolidated financial statements are an integral part of this condensed consolidated statement.

PPG INDUSTRIES, INC. AND SUBSIDIARIES

Condensed Consolidated Statement of Comprehensive Income (Unaudited)

(\$ in millions)

	Three Months Ended June 30		Six Months Ended June 30	
	2016	2015	2016	2015
Net income attributable to the controlling and noncontrolling interests	\$376	\$342	\$730	\$669
Other comprehensive income (loss), net of tax:				
Defined benefit pension and other postretirement benefits, net	24	6	43	74
Unrealized foreign currency translation adjustments	(135)	(27)	(84)	(299)
Derivative financial instruments, net	—	(2)	(8)	4
Other comprehensive loss, net of tax	(111)	(23)	(49)	(221)
Total comprehensive income	\$265	\$319	\$681	\$448
Less: amounts attributable to noncontrolling interests:				
Net income	(6)	(5)	(13)	(10)
Unrealized foreign currency translation adjustments	5	—	2	5
Comprehensive income attributable to PPG	\$264	\$314	\$670	\$443

The accompanying notes to the condensed consolidated financial statements are an integral part of this condensed consolidated statement.

PPG INDUSTRIES, INC. AND SUBSIDIARIES
Condensed Consolidated Balance Sheet (Unaudited)
(\$ in millions)

	June 30, 2016	December 31, 2015
Assets		
Current assets:		
Cash and cash equivalents	\$1,605	\$1,311
Short-term investments	64	144
Receivables (less allowance for doubtful accounts of \$51 in each period)	3,108	2,788
Inventories	1,803	1,705
Assets held for sale	148	—
Other	379	606
Total current assets	7,107	6,554
Property, plant and equipment (net of accumulated depreciation of \$4,354 and \$4,434)	2,950	3,017
Goodwill	3,602	3,669
Identifiable intangible assets, net	2,073	2,178
Deferred income taxes	540	672
Investments	322	367
Other assets	654	619
Total	\$17,248	\$17,076
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable and accrued liabilities	\$3,577	\$3,490
Asbestos settlement	—	796
Restructuring reserves	55	87
Short-term debt and current portion of long-term debt	686	283
Liabilities held for sale	57	—
Total current liabilities	4,375	4,656
Long-term debt	4,426	4,042
Accrued pensions	615	712
Other postretirement benefits	1,016	1,021
Asbestos settlement	—	252
Deferred income taxes	546	460
Other liabilities	837	864
Total liabilities	11,815	12,007
Commitments and contingent liabilities (Note 15)		
Shareholders' equity:		
Common stock	969	969
Additional paid-in capital	668	635
Retained earnings	16,034	15,521
Treasury stock, at cost	(9,576)	(9,440)
Accumulated other comprehensive loss	(2,749)	(2,702)
Total PPG shareholders' equity	5,346	4,983
Noncontrolling interests	87	86
Total shareholders' equity	5,433	5,069
Total	\$17,248	\$17,076

The accompanying notes to the condensed consolidated financial statements are an integral part of this condensed consolidated statement.

PPG INDUSTRIES, INC. AND SUBSIDIARIES
Condensed Consolidated Statement of Cash Flows (Unaudited)
(\$ in millions)

	Six Months Ended June 30	
	2016	2015
Operating activities:		
Net income attributable to controlling and noncontrolling interests	\$730	\$669
Less: Income from discontinued operations	—	(1)
Income from continuing operations	730	668
Adjustments to reconcile net income to cash from operations:		
Depreciation and amortization	242	245
Pension expense	37	49
Stock-based compensation expense	27	40
Business restructuring	—	140
Gain on sale of equity affiliate	(20)	—
Equity affiliate earnings, net of distributions received	(6)	(13)
Deferred income tax (benefit) expense	201	(46)
Cash contributions to pension plans	(13)	(283)
Restructuring cash spend	(30)	(22)
Cash paid for asbestos settlement funding	(813)	—
Change in certain asset and liability accounts:		
Receivables	(368)	(591)
Inventories	(104)	(80)
Other current assets	(26)	(84)
Accounts payable and accrued liabilities	139	20
Taxes and interest payable	(71)	136
Noncurrent assets and liabilities, net	4	27
Other	46	(20)
Cash (used for) / from operating activities	(25)	186
Investing activities:		
Capital expenditures	(168)	(162)
Business acquisitions, net of cash balances acquired	(10)	(26)
Proceeds from the disposition of PPG's interest in the Transitions Optical joint venture and sunlens business	—	47
Proceeds from sale of equity affiliate	41	—
Purchase of short-term investments	—	(97)
Proceeds from maturity of short-term investments	92	107
Payments for the settlement of cross currency swap contracts	(36)	(34)
Proceeds from cross currency swap and foreign currency contracts	19	38
Other	9	19
Cash used for investing activities	(53)	(108)
Financing activities:		
Net change in borrowing with maturities of three months or less	1	(12)
Net proceeds (payments) on commercial paper and short-term debt	988	(432)
Proceeds from the issuance of debt	3	1,242
Repayment of long-term debt	(252)	(338)
Purchase of treasury stock	(150)	(351)

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Issuance of treasury stock	23	50
Dividends paid	(203)	(189)
Other	(21)	(12)
Cash from / (used for) financing activities	389	(42)
Effect of currency exchange rate changes on cash and cash equivalents	(17)	(15)
Net increase in cash and cash equivalents	294	21
Cash and cash equivalents, beginning of period	1,311	686
Cash and cash equivalents, end of period	\$1,605	\$707

Supplemental disclosures of cash flow information:

Interest paid, net of amount capitalized	\$63	\$60
Taxes paid, net of refunds	\$185	\$158

The accompanying notes to the condensed consolidated financial statements are an integral part of this condensed consolidated statement.

PPG INDUSTRIES, INC. AND SUBSIDIARIES

Notes to Condensed Consolidated Financial Statements (Unaudited)

1. Basis of Presentation

The condensed consolidated financial statements included herein are unaudited and have been prepared following the requirements of the Securities and Exchange Commission and accounting principles generally accepted in the United States of America ("U.S. GAAP") for interim reporting. Under these rules, certain footnotes and other financial information that are normally required for annual financial statements can be condensed or omitted. These statements include all adjustments, consisting only of normal, recurring adjustments, necessary for a fair presentation of the financial position of PPG Industries, Inc. and its subsidiaries (the "Company" or "PPG") as of June 30, 2016, and the results of their operations for the three and six months ended June 30, 2016 and 2015 and their cash flows for the six months then ended. All intercompany balances and transactions have been eliminated. Material subsequent events are evaluated through the report issuance date and disclosed where applicable. These condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and notes included in PPG's Annual Report on Form 10-K for the year ended December 31, 2015.

Revenues, expenses, assets and liabilities can vary during each quarter of the year. Accordingly, the results of operations for the three and six months ended June 30, 2016 and the trends in these unaudited condensed consolidated financial statements may not necessarily be indicative of the results to be expected for the full year.

2. New Accounting Standards

In June 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-13, "Financial Instruments - Credit Losses." This ASU requires an organization to measure all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. Financial institutions and other organizations will now use forward-looking information to better inform their credit loss estimates. The amendments in this ASU are effective for fiscal years beginning after December 15, 2019, and for interim periods therein. PPG is in the process of assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

In April 2016, the FASB issued ASU No. 2016-10, "Identifying Performance Obligations and Licensing." This ASU addresses certain implementation issues that have surfaced since the issuance of ASU No. 2014-09 in May 2014. The ASU provides guidance in identifying performance obligations and determining the appropriate accounting for licensing arrangements. The amendments in this ASU are effective for fiscal years beginning after December 15, 2017, and for interim periods therein. PPG is in the process of assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

In March 2016, the FASB issued ASU No. 2016-09, "Improvements to Employee Share-Based Payment Accounting." This ASU simplifies certain aspects of the accounting for share-based payment transactions, including income tax requirements, forfeitures, and presentation on the balance sheet and the statement of cash flows. The amendments in this ASU are effective for annual periods beginning after December 15, 2016 and for the interim periods therein. PPG is in the process of assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

In March 2016, the FASB issued ASU No. 2016-08, "Principal versus Agent Considerations (Reporting Revenue Gross versus Net)." This ASU clarifies the revenue recognition implementation guidance for preparers on certain aspects of principal versus agent consideration. The amendments in this ASU are effective for annual periods beginning after December 15, 2017 and for interim periods therein. PPG is in the process of assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

In February 2016, the FASB issued ASU No. 2016-02, "Leases." This ASU requires all lessees to recognize on the balance sheet right to use assets and lease liabilities for the rights and obligations created by lease arrangements with terms greater than 12 months. The amendments in this ASU are effective for fiscal years beginning after December 15, 2018 and for interim periods therein. PPG is in the process of assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

In May 2014, the FASB issued ASU No. 2014-09, "Revenue from Contracts with Customers: Topic 606." This ASU replaces nearly all existing U.S. GAAP guidance on revenue recognition. The standard prescribes a five-step model for recognizing revenue, the application of which will require significant judgment. The amendments in this ASU are effective for fiscal years beginning after December 15, 2017, and for interim periods therein. PPG is in the process of

assessing the impact the adoption of this ASU will have on its consolidated financial position, results of operations and cash flows.

3. Acquisitions and Dispositions

Acquisitions

On July 1, 2016, PPG completed the acquisition of MetoKote Corporation ("MetoKote"). 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. Coated parts are then shipped to the customer's next stage of assembly. MetoKote coats an average of more than 1.5 million parts per day.

In conjunction with the 2013 separation of its commodity chemicals business, PPG conveyed to Axiall Corporation ("Axiall") its 60% ownership interest in Taiwan Chlorine Industries ("TCI"), a joint venture with China Petrochemical Development Corporation ("CPDC") located in Taiwan. Under PPG's agreement with CPDC, if certain post-closing conditions were not met following the 3 year anniversary of the separation, CPDC had the option to sell its 40% ownership interest in TCI to Axiall for \$100 million. In turn, Axiall had a right to designate PPG as its designee to purchase the 40% ownership interest of CPDC. On April 22, 2016, Axiall announced that CPDC had decided to sell its ownership interest in TCI to Axiall. On June 19, 2016, Axiall formally designated PPG to purchase the 40% ownership interest in TCI. PPG is evaluating its options regarding CPDC's exercise of the put and Axiall's subsequent designation of PPG to purchase the 40% ownership interest.

Dispositions

Flat Glass Business

On July 20, 2016, PPG signed a definitive agreement to sell the assets of its flat glass manufacturing and glass coatings operations to Vitro S.A.B. de C.V., a leading producer of flat glass and specialty products. The transaction is expected to close by the end of 2016, subject to customary closing conditions. PPG will receive approximately \$750 million in gross cash proceeds. PPG will report the assets and liabilities of the flat glass business as "Assets held for sale" and "Liabilities held for sale" on the condensed consolidated balance sheet and the results of operations of the flat glass business as discontinued operations on the condensed consolidated statements of income and cash flows beginning in the third quarter 2016.

Under the terms of the agreement, PPG will divest its entire flat glass manufacturing and glass coatings operations, including production sites located in Fresno, California; Salem, Oregon; Carlisle, Pennsylvania; and Wichita Falls, Texas; four distribution/fabrication facilities located across Canada; and a research-and-development center located in Harmar, Pennsylvania, near Pittsburgh. PPG's flat glass business includes approximately 1,200 employees. The business manufactures glass that is fabricated into products used primarily in commercial and residential construction.

European Fiber Glass Business

On June 20, 2016, PPG announced that it has signed an agreement for the sale of its European fiber glass operations to glass manufacturer Nippon Electric Glass Co. Ltd. ("NEG"). The transaction is subject to completion of employee consultation processes, receipt of regulatory clearances and other customary closing conditions. PPG and NEG expect to close the transaction in the second half of 2016. This transaction meets the criteria to be classified as assets held for sale and accordingly all assets and liabilities of the European fiber glass business have been reclassified to "Assets held for sale" and "Liabilities held for sale" as of June 30, 2016 on the condensed consolidated balance sheet.

The major classes of assets and liabilities of the European fiber glass operation included in the PPG condensed, consolidated balance sheet at June 30, 2016 were as follows:

(\$ in millions)	June 30, 2016
Receivables	\$28
Inventory	20
Other current assets	1
Property, plant, and equipment	55
Goodwill	43
Other non-current assets	1
Assets held for sale	\$148
Accounts payable and accrued liabilities	(34)
Accrued pensions	(20)
Other long-term liabilities	(3)
Liabilities held for sale	\$(57)

Pittsburgh Glass Works LLC

On April 21, 2016, PPG sold its minority ownership interest in Pittsburgh Glass Works LLC ("PGW") to LKQ Corporation concurrent with the majority partner's sale of its ownership interest. At March 31, 2016, the carrying value of PPG's investment in PGW was \$21 million. In conjunction with the sale, PPG received \$41 million in cash proceeds and recorded a pre-tax gain of \$20 million in the second quarter 2016. PPG accounted for its interest in PGW under the equity method of accounting. PPG's share of net earnings from PGW are reported in Other income in the Condensed, Consolidated Statement of Income for all periods presented and have not been reclassified as discontinued operations, as the divestiture of PGW does not represent a strategic shift in PPG's operations and PGW did not have a major impact on PPG's ongoing results of operations.

4. Inventories

(\$ in millions)	June 30, 2016	December 31, 2015
Finished products	\$1,148	\$ 1,082
Work in process	179	160
Raw materials	430	413
Supplies	46	50
Total Inventories	\$1,803	\$ 1,705

Most U.S. inventories are valued using the last-in, first-out method. These inventories represented approximately 38% and 39% of total inventories at June 30, 2016 and December 31, 2015, respectively. If the first-in, first-out method of inventory valuation had been used, inventories would have been \$140 million and \$163 million higher as of June 30, 2016 and December 31, 2015, respectively.

5. Goodwill and Other Identifiable Intangible Assets

The change in the carrying amount of goodwill attributable to each reportable segment for the six months ended June 30, 2016 was as follows:

(\$ in millions)	Performance Coatings	Industrial Coatings	Glass	Total
Balance, December 31, 2015	\$ 3,073	\$ 552	\$44	\$3,669
Acquisitions	(2)	—	—	(2)
Reclassifications to Assets held for sale	—	—	(43)	(43)
Currency	(30)	9	(1)	(22)
Balance, June 30, 2016	\$ 3,041	\$ 561	\$—	\$3,602

The carrying amount of acquired trademarks with indefinite lives totaled \$1.2 billion and \$1.3 billion as of June 30, 2016 and December 31, 2015, respectively.

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The Company's identifiable intangible assets with finite lives are being amortized over their estimated useful lives and are detailed below:

(\$ in millions)	June 30, 2016			December 31, 2015		
	Gross Carrying Amount	Accumulated Amortization	Net	Gross Carrying Amount	Accumulated Amortization	Net
Acquired technology	\$572	\$ (436)	) \$136	\$572	\$ (421)	) \$151
Customer-related intangibles	1,272	(617)	) 655	1,267	(574)	) 693
Trade names	135	(70)	) 65	132	(61)	) 71
Other	39	(28)	) 11	39	(26)	) 13
Balance	\$2,018	\$ (1,151)	) \$867	\$2,010	\$ (1,082)	) \$928

Aggregate amortization expense related to these identifiable intangible assets for the three and six months ended June 30, 2016 was \$30 million and \$60 million, respectively, and for the three and six months ended June 30, 2015 was \$33 million and \$66 million, respectively.

As of June 30, 2016, estimated future amortization expense of identifiable intangible assets is as follows:

(\$ in millions)	Future Amortization Expense
Remaining six months of 2016	\$ 65
2017	125
2018	120
2019	110
2020	95
2021	95
Thereafter	257

6. Business Restructuring

The Company records restructuring liabilities that represent charges incurred in connection with consolidations of certain operations, including operations from acquisitions, as well as headcount reduction programs. These charges consist primarily of severance costs and asset write-downs.

In April 2015, the Company approved a business restructuring plan which includes actions necessary to achieve cost synergies related to recent acquisitions. In addition, the program aims to further align employee levels and production capacity in certain businesses and regions with current product demand, as well as reductions in various global administrative functions. A pre-tax restructuring charge of \$140 million was recorded in PPG's second quarter 2015 financial results, of which about 85% represents employee severance and other cash costs. The restructuring actions are expected to be substantially completed during 2016.

The 2015 restructuring charge and the reserve activity for 2015 and the six months ended June 30, 2016 was as follows:

(\$ in millions, except for employees impacted)	Severance and Other Costs	Asset Write-offs	Total Reserve	Employees Impacted
Performance Coatings	\$ 71	\$ 6	\$ 77	1,259
Industrial Coatings	42	13	55	534
Glass	4	—	4	33
Corporate	4	—	4	27
Total second quarter 2015 restructuring charge	\$ 121	\$ 19	\$ 140	1,853
2015 Activity	(32)	(19)	(51)	(1,047)
Foreign currency impact	(2)	—	(2)	—
Balance as of December 31, 2015	\$ 87	\$ —	\$ 87	806
2016 Activity	(31)	—	(31)	(456)
Foreign currency impact	(1)	—	(1)	—
Balance as of June 30, 2016	\$ 55	\$ —	\$ 55	350

7. Borrowings

In May 2016, PPG entered into two \$250 million Term Loan Credit Agreements. One term loan agreement is with the Bank of Tokyo-Mitsubishi UFJ, Ltd. (the “BTM Term Loan”) under which the Company has borrowed \$250 million. The second term loan credit agreement is with BNP Paribas (the “BNP Term Loan”) under which the Company has borrowed \$250 million. The BTM Term Loan terminates and all amounts outstanding are payable on March 30, 2017. The BNP Term Loan terminates and all amounts outstanding are payable on May 26, 2017.

In January 2016, PPG’s \$250 million 1.9% notes matured, and PPG repaid these notes with cash on hand.

In June 2015, PPG’s €300 million Euro-denominated notes matured, and PPG repaid these notes with cash on hand (\$336 million).

In March 2015, PPG completed a public offering of €600 million 0.875% Notes due 2022 and €600 million 1.400% Notes due 2027 (together, the “Notes”), or €1.2 billion (\$1.26 billion) in aggregate principal amount. The aggregate cash proceeds from the Notes, net of discounts and fees, was \$1.24 billion. The Notes are denominated in Euro and have been designated as hedges of net investments in the Company’s European operations.

8. Earnings Per Share

The effect of dilutive securities on the weighted average common shares outstanding included in the calculation of earnings per diluted common share for the three and six months ended June 30, 2016 and 2015 were as follows:

(number of shares in millions)	Three Months Ended June 30		Six Months Ended June 30	
	2016	2015	2016	2015
Weighted average common shares outstanding	267.2	272.5	267.4	272.8
Effect of dilutive securities:				
Stock options	0.9	1.1	0.9	1.1
Other stock compensation plans	1.0	1.1	0.9	1.2
Potentially dilutive common shares	1.9	2.2	1.8	2.3
Adjusted weighted average common shares outstanding	269.1	274.7	269.2	275.1

Excluded from the computation of earnings per diluted share due to their antidilutive effect were 0.6 million outstanding stock options for the three and six months ended June 30, 2016. There were no antidilutive outstanding stock options for the three and six months ended June 30, 2015.

9. Income Taxes

Six Months
 Ended
 June 30
 2016 2015

Effective tax rate on pre-tax income from continuing operations 36.2% 24.3%

In June 2016, the Company recorded a \$128 million net tax charge associated with the funding of the asbestos settlement trust ("Trust") described in Note 15, "Commitments and Contingent Liabilities." The Company provided taxes on certain of its foreign subsidiaries earnings to fund the Trust using cash from various jurisdictions. Also in conjunction with the funding of the Trust, PPG recorded certain one-time book tax benefits associated with the contribution of PPG's interest in Pittsburgh Corning's European subsidiary to the Trust and a change in measurement of certain deferred tax liabilities.

The effective tax rate for 2015 is lower than the U.S. federal statutory rate primarily due to earnings in foreign jurisdictions which are taxed at rates lower than the U.S. statutory rate, the U.S. tax benefit on foreign dividends paid and the impact of certain U.S. tax incentives. The 2016 rate includes similar benefits; however, they are more than offset by the asbestos settlement net tax charge.

The Company files federal, state and local income tax returns in numerous domestic and foreign jurisdictions. In most tax jurisdictions, returns are subject to examination by the relevant tax authorities for a number of years after the returns have been filed. The Company is no longer subject to examinations by tax authorities in any major tax jurisdiction for years before 2006. In addition, the Internal Revenue Service ("IRS") has completed its examination of the Company's U.S. federal income tax returns filed for years through 2011. The IRS is currently conducting its examination of the Company's U.S. federal income tax return for 2012 and 2013.

10. Pensions and Other Postretirement Benefits

Net periodic pension and other post-retirement benefit costs are included in "Cost of sales, exclusive of depreciation and amortization," "Selling, general and administrative" and "Research and development" in the accompanying condensed consolidated statement of income.

The net periodic pension and other post-retirement benefit costs for the three and six months ended June 30, 2016 and 2015 were as follows:

	Pensions			
	Three		Six	
	Months		Months	
	Ended		Ended	
	June 30		June 30	
(\$ in millions)	2016	2015	2016	2015
Service cost	\$13	\$15	\$27	\$30
Interest cost	44	53	87	103
Expected return on plan assets	(69)	(69)	(138)	(139)
Amortization of actuarial losses	31	25	62	55
Amortization of prior service credit	(1)	—	(1)	(1)
Curtailments and special termination benefits	—	1	—	1
Net periodic benefit cost	\$18	\$25	\$37	\$49

	Other Postretirement Benefits			
	Three		Six	
	Months		Months	
	Ended		Ended	
	June 30		June 30	
(\$ in millions)	2016	2015	2016	2015
Service cost	\$3	\$5	\$7	\$10
Interest cost	10	12	20	24
Amortization of actuarial losses	5	8	9	16
Amortization of prior service credit	(2)	(2)	(4)	(5)
Net periodic benefit cost	\$16	\$23	\$32	\$45

PPG expects its net periodic pension and other post-retirement benefit cost, excluding settlement losses, for 2016 will be approximately \$140 million, with pension representing approximately \$75 million and other post-retirement benefit cost representing approximately \$65 million.

In 2016, PPG changed the method it uses to estimate the service and interest cost components of net periodic benefit cost for pension and other postretirement benefit costs for substantially all of its U.S. and foreign plans. Historically, the service and interest cost components were estimated using a single weighted-average discount rate derived from the yield curve used to measure the projected benefit obligation at the beginning of the period. PPG has elected to use a full yield curve approach ("Split-rate") to estimate these components of benefit cost by applying specific spot rates along the yield curve used to determine the benefit obligation to the relevant projected cash flows. PPG made this change to improve the correlation between projected benefit cash flows and the corresponding yield curve spot rates and to provide a more precise measurement of service and interest costs. This change does not affect the measurement of the Company's total benefit obligations. PPG accounted for this change as a change in estimate and, accordingly, is recognizing its effect prospectively beginning in fiscal year 2016.

Contributions to Defined Benefit Pension Plans

Three	Six
Months	Months
Ended	Ended
June 30	June 30

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(\$ in millions)	2016	2015	2016	2015
U.S. defined benefit pension voluntary contributions	\$ —	\$ —	\$ —	\$250
Non-U.S. defined benefit pension voluntary contributions	\$ —	\$ —	\$ —	\$21
Non-U.S. defined benefit pension mandatory contributions	\$ 7	\$ —	\$13	\$12

PPG is not required to make any mandatory contributions to its U.S. defined benefit pension plans in 2016. PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of \$20 million to \$25 million over

the remaining six months of 2016. As noted below, we expect to make voluntary contributions to our defined benefit pension plans in 2016 and beyond.

Retained Liabilities and Legacy Settlement Charges

PPG has retained certain liabilities for pension and post-retirement benefits earned for service up to the date of sale of its former automotive glass and service business for employees who were active as of the divestiture date and for individuals who were retirees of the business as of the divestiture date. There have been multiple PPG facilities closures in Canada related to the former automotive glass and services business as well as other PPG businesses. These various plant closures have resulted in partial and full windups, and related settlement charges, of pension plans for various hourly and salary employees employed by these locations. The charges are recorded for the individual plans when a particular windup is approved by the Canadian pension authorities and the Company has made all contributions to the individual plan. There were no charges recorded in the six months ended June 30, 2016 or 2015; however, additional windup charges of \$45 million to \$55 million are expected during the remaining six months of 2016 related to these plant closures. Cash contributions related to these future windups are expected to be in the range of \$5 million to \$10 million.

Pension Annuity Contracts

On June 24, 2016, the Company entered into (a) a Definitive Purchase Agreement by and among the Company, Massachusetts Mutual Life Insurance Company (“MassMutual”) and State Street Bank & Trust Company (“State Street”), as independent fiduciary to the Company’s United States defined benefit pension plans (the “Plans”), and (b) a Definitive Purchase Agreement by and among the Company, Metropolitan Life Insurance Company (“MetLife”) and State Street, pursuant to which the Plans will purchase group annuity contracts that will irrevocably transfer to the two insurance companies the future pension benefit obligations for approximately 13,200 of the Company’s retirees in the United States who started receiving their monthly retirement benefit payments on or before April 1, 2016.

Upon issuance of the group annuity contracts, the value of the benefit obligation of each affected former salaried employee’s retirement benefit obligation will be irrevocably guaranteed by, and split equally between, MassMutual and MetLife. Pursuant to these Definitive Purchase Agreements, MassMutual will serve as the lead administrator and, beginning September 1, 2016, it will make each former salaried employee’s full annuity payment on behalf of itself and MetLife. The value of the benefit obligation of each affected former hourly employee’s retirement benefit obligation will be irrevocably guaranteed by MetLife, and MetLife will serve as the administrator. Beginning September 1, 2016, MetLife will make each former hourly employee’s full annuity payment.

The amount of each affected retiree’s annuity payment will be equal to the amount of such individual’s pension benefit. By irrevocably transferring the obligations to MassMutual and MetLife, the Company will reduce its overall pension projected benefit obligation by approximately \$1.6 billion. The purchase of group annuity contracts will be funded directly by the assets of the Plans.

The Definitive Purchase Agreements each contain closing conditions customary for a transaction of this nature, including certain termination clauses. Assuming all closing conditions are satisfied, the Company expects the purchase of the irrevocable group annuity contracts would occur in the third quarter of 2016.

The Company expects to make contributions aggregating approximately \$175 million to the Plans in 2016 and 2017. These contributions will be funded by cash on hand. The Company expects to recognize a non-cash pension settlement charge of approximately \$500 million to \$600 million after-tax (approximately \$800 million to \$1.0 billion pre-tax) in the third quarter of 2016 resulting from the purchase of the group annuity contracts.

11. Shareholders' Equity

Changes to shareholders' equity for the six months ended June 30, 2016 and 2015 were as follows:

(\$ in millions)	Total PPG Shareholders' Equity	Non- controlling Interests	Total
Balance, January 1, 2016	\$ 4,983	\$ 86	\$5,069
Net income	717	13	730
Other comprehensive income, net of tax	(47)	(2)	(49)
Cash dividends	(203)	—	(203)
Issuance of treasury stock	46	—	46
Stock repurchase program	(150)	—	(150)
Other	—	(10)	(10)
Balance, June 30, 2016	\$ 5,346	\$ 87	\$5,433
(\$ in millions)	Total PPG Shareholders' Equity	Non- controlling Interests	Total
Balance, January 1, 2015	\$ 5,180	\$ 85	\$5,265
Net income	659	10	669
Other comprehensive income, net of tax	(216)	(5)	(221)
Cash dividends	(189)	—	(189)
Issuance of treasury stock	65	—	65
Stock repurchase program	(351)	—	(351)
Stock-based compensation activity	23	—	23
Other	—	(5)	(5)
Balance, June 30, 2015	\$ 5,171	\$ 85	\$5,256

12. Accumulated Other Comprehensive Loss

(\$ in millions)	Unrealized Foreign Currency Translation Adjustments	Pension and Other Postretirement Benefit Adjustments, net of tax	Unrealized Gain (Loss) on Derivatives, net of tax	Accumulated Other Comprehensive (Loss) Income
Balance, January 1, 2016	\$(1,332)	\$(1,379)	\$9	\$(2,702)
Current year deferrals to AOCI	(85) ^(a)	—	—	(85)
Current year deferrals to AOCI, tax effected	3 ^(b)	17 ^(c)	2 ^(d)	22
Reclassifications from AOCI to net income	—	26 ^(c)	(10) ^(d)	16
Net change	\$(82)	\$43	\$(8)	\$(47)
Balance, June 30, 2016	\$(1,414)	\$(1,336)	\$1	\$(2,749)
Balance, January 1, 2015	\$(628)	\$(1,492)	\$4	\$(2,116)
Current year deferrals to AOCI	(387) ^(a)	—	—	(387)
Current year deferrals to AOCI, tax effected	93 ^(b)	32 ^(c)	(23) ^(d)	102
Reclassifications from AOCI to net income	—	42 ^(c)	27 ^(d)	69
Net change	\$(294)	\$74	\$4	\$(216)
Balance, June 30, 2015	\$(922)	\$(1,418)	\$8	\$(2,332)

(a) - Unrealized foreign currency translation adjustments related to the translation of foreign denominated balance sheet account balances are not presented net of tax given that no deferred U.S. income taxes have been provided on the undistributed earnings of non-U.S. subsidiaries because they are deemed to be reinvested for an indefinite period of time.

(b) - The tax (benefit) cost related to unrealized foreign currency translation adjustments on tax inter-branch transactions and net investment hedges for the six months ended June 30, 2016 and 2015 was \$(46) million and \$20 million, respectively. The balance also includes a remeasurement of the tax cost on certain foreign proceeds which have not been permanently reinvested.

(c) - The tax (benefit) cost related to the adjustment for pension and other postretirement benefits for the six months ended June 30, 2016 and 2015 was \$(20) million and \$31 million, respectively. Reclassifications from AOCI are included in the computation of net periodic pension and other post-retirement benefit costs (See Note 10, "Pensions and Other Postretirement Benefits").

(d) - The tax (benefit) cost related to the changes in the unrealized gain on derivatives for the six months ended June 30, 2016 and 2015 was \$(3) million and \$1 million, respectively. Reclassifications from AOCI are included in the gain recognized on cash flow hedges (See Note 13, "Financial Instruments, Hedging Activities and Fair Value Measurements").

13. Financial Instruments, Hedging Activities and Fair Value Measurements

Financial instruments include cash and cash equivalents, short-term investments, cash held in escrow, marketable equity securities, accounts receivable, company-owned life insurance, accounts payable, short-term and long-term debt instruments, and derivatives. The fair values of these financial instruments approximated their carrying values at June 30, 2016 and December 31, 2015, in the aggregate, except for long-term debt instruments.

Hedging Activities

The Company has exposure to market risk from changes in foreign currency exchange rates and interest rates. Prior to the settlement of the Asbestos Settlement Trust described in Note 15 "Commitments and Contingent Liabilities," the Company had exposure to changes in PPG's stock price. As a result, financial instruments, including derivatives, may be used to hedge these underlying economic exposures. Certain of these instruments qualify as cash flow, fair value and net investment hedges upon meeting the requisite criteria, including effectiveness of offsetting hedged or underlying exposures. Changes in the fair value of derivatives that do not qualify for hedge accounting are recognized in income from continuing operations in the period incurred.

PPG's policies do not permit speculative use of derivative financial instruments. PPG enters into derivative financial instruments with high credit quality counterparties and diversifies its positions among such counterparties in order to reduce its exposure to credit losses. The Company did not realize a credit loss on derivatives during the three and six month periods ended June 30, 2016 and 2015.

All of PPG's outstanding derivative instruments are subject to accelerated settlement in the event of PPG's failure to meet its debt or payment obligations under the terms of the instruments' contractual provisions. In addition, should the Company be acquired and its payment obligations under the derivative instruments' contractual arrangements not be assumed by the acquirer, or should PPG enter into bankruptcy, receivership or reorganization proceedings, the instruments would also be subject to accelerated settlement.

There were no derivative instruments de-designated or discontinued as hedging instruments during the three and six month periods ended June 30, 2016 and 2015.

Fair Value Hedges

PPG designates certain foreign currency forward contracts as hedges against the Company's exposure to future changes in fair value of certain firm sales commitments denominated in foreign currencies. As of June 30, 2016 and 2015, the fair value of these contracts were insignificant.

Prior to June 8, 2016, PPG entered into renewable equity forward arrangements to hedge the impact to PPG's income from continuing operations for changes in the fair value of 2,777,778 shares of PPG stock that were contributed to the asbestos settlement trust as discussed in Note 15, "Commitments and Contingent Liabilities." These financial instruments were recorded at fair value as assets or liabilities and changes in the fair value of these financial instruments are reflected in the "Asbestos settlement – net" caption of the accompanying condensed consolidated statement of income. The total principal amount paid for these shares was approximately \$60 million. During the terms of these equity forward arrangements, PPG paid to the counterparty interest based on the principal amount and the counterparty paid to PPG an amount equal to the dividends paid on these shares which reduced the transaction price by approximately \$10 million, net. The difference between the principal amount and any amounts related to unpaid interest or dividends and the market price for these shares, adjusted for credit risk, represented the fair value of these financial instruments as well as the amount that PPG received when the counterparty chose to net settle these financial instruments. In conjunction with the funding of the Asbestos Settlement Trust, the equity forward arrangements were settled. At settlement on June 9, 2016, the fair value of these arrangements was an asset of \$258 million.

Interest rate swaps have been used from time to time to manage the Company's exposure to changing interest rates. When outstanding, the interest rate swaps were designated as fair value hedges of certain outstanding debt obligations of the Company and were recorded at fair value. There were no interest rate swaps outstanding as of June 30, 2016 and December 31, 2015. However, in prior years, PPG settled interest rate swaps and received or paid cash. The fair value adjustment of the debt at the time the interest rate swaps were settled is still being amortized as a reduction to interest expense over the remaining term of the related debt which matures in 2021.

Cash Flow Hedges

PPG designates certain foreign currency forward contracts as cash flow hedges of the Company's exposure to variability in exchange rates on intercompany and third party transactions denominated in foreign currencies. As of June 30, 2016 and December 31, 2015, the fair value of all foreign currency forward contracts designated as cash flow hedges was a net asset of \$13 million and \$44 million, respectively.

Net Investment Hedges

PPG uses cross currency swaps, foreign currency forward contracts and Euro-denominated debt to hedge a portion of its net investment in its European operations. As of June 30, 2016, U.S. dollar to Euro cross currency swap contracts with a total notional amount of \$560 million were outstanding and are scheduled to expire in March 2018. On settlement of the outstanding contracts, PPG will receive \$560 million U.S. dollars and pay Euros to the counterparties. During the term of these contracts, PPG will receive semiannual payments in March and September of each year based on a U.S. dollar, long-term interest rate fixed as of the contract inception date, and PPG will make annual payments in March of each year to the counterparties based on a Euro, long-term interest rate fixed as of the contract inception date. As of June 30, 2016 and December 31, 2015, the fair value of these contracts was a net asset of \$53 million and \$41 million, respectively.

As of June 30, 2016 and December 31, 2015, PPG had designated €1.9 billion Euro-denominated borrowings as hedges of a portion of its net investment in the Company's European operations. The carrying value of these instruments as of June 30, 2016 and December 31, 2015 was \$2.1 billion and \$2.0 billion, respectively.

Gains/Losses Deferred in AOCI

As of June 30, 2016 and December 31, 2015, the Company had accumulated pre-tax unrealized translation gains in AOCI related to the Euro-denominated borrowings, foreign currency forward contracts and the cross currency swaps of \$300 million and \$349 million, respectively.

The following tables summarize the location within the financial statements and amount of gains (losses) related to derivative financial instruments for the six months ended June 30, 2016 and 2015. All dollar amounts are shown on a pre-tax basis.

Hedge Type	June 30, 2016	
	Loss	Gain (Loss) Recognized
Fair Value		
Equity forward arrangements	Not applicable	Asbestos settlement - net
Total Fair Value		\$35
Cash Flow		
Foreign currency forward contracts (a)	\$(13)	\$(2) Other charges
Total Cash Flow	\$(13)	\$(2)
Net Investment		
Cross currency swaps	\$(6)	
Foreign denominated debt	(43)	
Total Net Investment	\$(49)	

(a) The ineffective portion related to this item was \$2 million of income.

Hedge Type	June 30, 2015	
	Gain	Gain (Loss) Recognized
Fair Value		
Equity forward arrangements	Not applicable	Asbestos settlement - net
Total Fair Value		\$(1)
Cash Flow		
Foreign currency forward contracts (a)	39	34 Other charges
Total Cash Flow	\$39	\$34
Net Investment		
Cross currency swaps	\$61	
Foreign currency forward contracts	19	
Foreign denominated debt	33	
Total Net Investment	\$113	

Economic
Foreign currency forward contracts \$18 Other charges

(a) The ineffective portion related to this item was \$4 million of expense.

Fair Value Measurements

The Company follows a fair value measurement hierarchy to measure its assets and liabilities. As of June 30, 2016 and December 31, 2015, the assets and liabilities measured at fair value on a recurring basis were cash equivalents, equity securities and derivatives. In addition, the Company measures its pension plan assets at fair value (see Item 8. Financial Statements and Supplementary Data - Note 12, "Employee Benefit Plans" in the Company's 2015 Annual Report on Form 10-K for further details). The Company's financial assets and liabilities are measured using inputs from the following three levels:

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets and liabilities that the Company has the ability to access at the measurement date. Level 1 inputs are considered to be the most reliable evidence of fair value as they are based on unadjusted quoted market prices from various financial information service providers and securities exchanges.

Level 2 inputs are directly or indirectly observable prices that are not quoted on active exchanges, which include quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability and inputs that

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are derived principally from or corroborated by observable market data by correlation or other means. The fair values of the derivative instruments reflect the instruments' contractual terms, including the period to maturity, and uses observable market-based inputs, including forward curves.

Level 3 inputs are unobservable inputs employed for measuring the fair value of assets or liabilities. The Company does not have any recurring financial assets or liabilities that are recorded in its consolidated balance sheets as of June 30, 2016 and December 31, 2015 that are classified as Level 3 inputs.

Assets and liabilities reported at fair value on a recurring basis:

(\$ in millions)	June 30, 2016		
	Level 1	Level 2	Level 3
Assets:			
Other current assets:			
Marketable equity securities	\$ 4	\$ —	\$ —
Foreign currency forward contracts	24	—	—
Equity forward arrangement	—	—	—
Investments:			
Marketable equity securities	76	—	—
Other Assets:			
Cross currency swaps	—	53	—
Liabilities:			
Accounts payable and accrued liabilities:			
Foreign currency forward contracts	—	7	—

(\$ in millions)	December 31, 2015		
	Level 1	Level 2	Level 3
Assets:			
Other current assets:			
Marketable equity securities	\$ 4	\$ —	\$ —
Foreign currency forward contracts	—	47	—
Equity forward arrangement	—	223	—
Investments:			
Marketable equity securities	77	—	—
Other assets:			
Cross currency swaps	—	41	—
Liabilities:			
Accounts payable and accrued liabilities:			
Foreign currency forward contracts	—	4	—

(\$ in millions)	June 30,	December
	2016 (a)	31, 2015 (b)
Long-term debt - carrying value	\$ 4,400	\$ 4,265
Long-term debt - fair value	\$ 4,704	\$ 4,367

(a) Excluding capital lease obligations of \$29 million and short term borrowings of \$682 million as of June 30, 2016.

(b) Excluding capital lease obligations of \$30 million and short term borrowings of \$29 million as of December 31, 2015.

The fair values of the debt instruments were based on discounted cash flows and interest rates then currently available to the Company for instruments of the same remaining maturities and were measured using level 2 inputs.

Assets and liabilities reported at fair value on a nonrecurring basis:

There were no significant adjustments to the fair value of nonmonetary assets or liabilities for the six months ended June 30, 2016, or for the year ended December 31, 2015.

14. Stock-Based Compensation

The Company's stock-based compensation includes stock options, restricted stock units ("RSUs") and grants of contingent shares that are earned based on achieving targeted levels of total shareholder return. All current grants of stock options, RSUs and contingent shares are made under the PPG Industries, Inc. Amended and Restated Omnibus Incentive Plan (the "PPG Amended Omnibus Plan"), which was amended and restated effective April 21, 2016. Shares available for future grants under the PPG Amended Omnibus Plan were 9.8 million as of June 30, 2016.

Stock-based compensation and the income tax benefit recognized during the three and six months ended June 30, 2016 and 2015 were as follows:

	Three Months Ended June 30		Six Months Ended June 30	
(\$ in millions)	2016	2015	2016	2015
Stock-based compensation	\$17	\$25	\$27	\$40
Income tax benefit recognized	\$6	\$9	\$10	\$14

Grants of stock-based compensation during the six months ended June 30, 2016 and 2015 were as follows:

Grant Details	Six Months Ended June 30			
	2016		2015	
	Shares	Fair Value	Shares	Fair Value
Stock options	775,319	\$17.89	583,172	\$26.98
Restricted stock units	254,750	\$91.37	193,990	\$114.02
Contingent shares (a)	59,645	\$95.00	63,308	\$118.12

(a) The number of contingent shares represents the target value of the award.

Stock options are generally exercisable 36 months after being granted and have a maximum term of 10 years.

Compensation expense for stock options is recorded over the vesting period based on the fair value on the date of grant. The fair value of the stock option grants issued in the six months ended June 30, 2016 was calculated with the following weighted average assumptions:

Weighted average exercise price	\$95.06
Risk-free interest rate	1.6 %
Expected life of option in years	6.5
Expected dividend yield	2.1 %
Expected volatility	22.8 %

The risk-free interest rate is determined by using the U.S. Treasury yield curve at the date of the grant and using a maturity equal to the expected life of the option. The expected life of options is calculated using the average of the vesting term and the maximum term, as prescribed by accounting guidance on the use of the simplified method for determining the expected term of an employee share option. The expected dividend yield and volatility are based on historical stock prices and dividend amounts over past time periods equal in length to the expected life of the options. Time-based RSUs generally vest over the three-year period following the date of grant, unless forfeited, and will be paid out in the form of stock, cash or a combination of both at the Company's discretion at the end of the vesting period. Performance-based RSUs vest based on achieving specific annual performance targets for earnings per share growth and cash flow return on capital over the three calendar year-end periods following the date of grant. Unless forfeited, the performance-based RSUs will be paid out in the form of stock, cash or a combination of both at the Company's discretion at the end of the three-year performance period if PPG meets the performance targets. Contingent share grants (referred to as "TSR awards") are made annually and are paid out at the end of each three-year period following the date of grant based on PPG's performance. Performance is measured by determining the percentile rank of the total shareholder return of PPG common stock in relation to the total shareholder return of the S&P 500 as it existed at the beginning of the three-year performance period excluding any companies that have been

removed from the index because they ceased to be publicly traded during the performance period. Any payments made at the end of the award period may be in the form of stock, cash or a combination of both. The TSR awards qualify as liability awards, and compensation expense is recognized over the three-year award period based on the

fair value of the awards (giving consideration to the Company's percentile rank of total shareholder return) remeasured in each reporting period until settlement of the awards.

15. Commitments and Contingent Liabilities

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. These lawsuits and claims may relate to contract, patent, environmental, product liability, antitrust and other matters arising out of the conduct of PPG's current and past business activities. To the extent that these lawsuits and claims involve personal injury and property damage, PPG believes it has adequate insurance; however, certain of PPG's insurers are contesting coverage with respect to some of these claims, and other insurers, as they had prior to the asbestos settlement described below, may contest coverage in the future. PPG's lawsuits and claims against others include claims against insurers and other third parties with respect to actual and contingent losses related to environmental, asbestos and other matters.

The results of any current or future litigation and claims are inherently unpredictable. However, management believes that, in the aggregate, the outcome of all lawsuits and claims involving PPG, including asbestos-related claims, 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.

Foreign Tax Matter

In June 2014, PPG received a notice from a Foreign Tax Authority ("FTA") inviting the Company to pay interest totaling approximately \$70 million for failure to withhold taxes on a 2009 intercompany dividend. Prior to the payment of the dividend, PPG obtained a ruling from the FTA which indicated that the dividend was tax-exempt and eligible for a simplified no-withholding procedure provided that certain administrative criteria were met. The FTA is now asserting that PPG did not meet all of the administrative criteria for the simplified procedure, and consequently taxes should have been withheld by the dividend payer, which would have made the dividend recipient eligible for a refund. The Company disagrees with the FTA's assertion. In March 2015, PPG received a formal assessment from the FTA. PPG plans to vigorously defend against the assessment.

Asbestos Matters

For over 30 years, PPG has been a defendant in lawsuits involving claims alleging personal injury from exposure to asbestos. Most of PPG's potential exposure relates to allegations by plaintiffs that PPG should be liable for injuries involving asbestos-containing thermal insulation products, known as Unibestos, manufactured and distributed by Pittsburgh Corning Corporation ("PC"). PPG and Corning Incorporated are each 50% shareholders of PC. PPG has denied responsibility for, and has defended, all claims for any injuries caused by PC products. As of the April 16, 2000 order which stayed and enjoined asbestos claims against PPG (as discussed below), PPG was one of many defendants in numerous asbestos-related lawsuits involving approximately 114,000 claims served on PPG. During the period of the stay, which expired on its own terms on May 27, 2016, PPG generally has not been aware of the dispositions, if any, of these asbestos claims.

Background of PC Bankruptcy Plan of Reorganization

On April 16, 2000, PC filed for Chapter 11 Bankruptcy in the U.S. Bankruptcy Court for the Western District of Pennsylvania located in Pittsburgh, Pa. Accordingly, in the first quarter of 2000, PPG recorded an after-tax charge of \$35 million for the write-off of all of its investment in PC. As a consequence of the bankruptcy filing and various motions and orders in that proceeding, the asbestos litigation against PPG (as well as against PC) had been stayed and the filing of additional asbestos suits against them had been enjoined until 30 days after the effective date of a confirmed plan of reorganization for PC substantially in accordance with the settlement arrangement among PPG and several other parties discussed below. The stay expired on May 27, 2016, 30 days after the effective date of a confirmed plan of reorganization.

On May 14, 2002, PPG announced that it had agreed with several other parties, including certain of its insurance carriers, the official committee representing asbestos claimants in the PC bankruptcy, and the legal representatives of future asbestos claimants appointed in the PC bankruptcy, on the terms of a settlement arrangement relating to certain asbestos claims against PPG and PC (the "2002 PPG Settlement Arrangement").

On March 28, 2003, Corning Incorporated announced that it had separately reached its own arrangement with the representatives of asbestos claimants for the settlement of certain asbestos claims against Corning Incorporated and

PC (the “2003 Corning Settlement Arrangement”).

The terms of the 2002 PPG Settlement Arrangement and the 2003 Corning Settlement Arrangement were incorporated into a bankruptcy reorganization plan for PC along with a disclosure statement describing the plan, which PC filed with the Bankruptcy Court on April 30, 2003. Amendments to the plan and disclosure statement were subsequently filed.

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On November 26, 2003, after considering objections to the second amended disclosure statement and plan of reorganization, the Bankruptcy Court entered an order approving such disclosure statement and directing that it be sent to creditors, including asbestos claimants, for voting. In March 2004, the second amended PC plan of reorganization (the “second amended PC plan of reorganization”) received the required votes to approve the plan with a channeling injunction for present and future asbestos claimants under §524(g) of the Bankruptcy Code. After voting results for the second amended PC plan of reorganization were received, the Bankruptcy Court judge conducted a hearing regarding the fairness of the settlement, including whether the plan would be fair with respect to present and future claimants, whether such claimants would be treated in substantially the same manner, and whether the protection provided to PPG and its participating insurers would be fair in view of the assets they would convey to the asbestos settlement trust (the “Trust”) to be established as part of the second amended PC plan of reorganization. At that hearing, creditors and other parties in interest raised objections to the second amended PC plan of reorganization. Following that hearing, the Bankruptcy Court scheduled oral arguments for the contested items.

The Bankruptcy Court heard oral arguments on the contested items on November 17-18, 2004. At the conclusion of the hearing, the Bankruptcy Court agreed to consider certain post-hearing written submissions. In a further development, on February 2, 2005, the Bankruptcy Court established a briefing schedule to address whether certain aspects of a decision of the U.S. Third Circuit Court of Appeals in an unrelated case had any applicability to the second amended PC plan of reorganization. Oral arguments on these matters were subsequently held in March 2005. During an omnibus hearing on February 28, 2006, the Bankruptcy Court judge stated that she was prepared to rule on the PC plan of reorganization in the near future, provided certain amendments were made to the plan. Those amendments were filed, as directed, on March 17, 2006. After further conferences and supplemental briefings, in December 2006, the court denied confirmation of the second amended PC plan of reorganization, on the basis that the plan was too broad in the treatment of allegedly independent asbestos claims not associated with PC.

Terms of 2002 PPG Settlement Arrangement

PPG had no obligation to pay any amounts under the 2002 PPG Settlement Arrangement until 30 days after the second amended PC plan of reorganization was finally approved by an appropriate court order that was no longer subject to appellate review (the “Effective Date”). If the second amended PC plan of reorganization had been approved as proposed, PPG and certain of its insurers (along with PC) would have made payments on the Effective Date to the Trust, which would have provided the sole source of payment for all present and future asbestos bodily injury claims against PPG, its subsidiaries or PC alleged to be caused by the manufacture, distribution or sale of asbestos products by these companies. PPG would have conveyed the following assets to the Trust: (i) the stock it owns in PC and Pittsburgh Corning Europe, (ii) 2,777,778 shares of PPG’s common stock and (iii) aggregate cash payments to the Trust of approximately \$998 million, payable according to a fixed payment schedule over 21 years, beginning on June 30, 2003, or, if later, the Effective Date. PPG would have had the right, in its sole discretion, to prepay these cash payments to the Trust at any time at a discount rate of 5.5% per annum as of the prepayment date. In addition to the conveyance of these assets, PPG would have paid \$30 million in legal fees and expenses on behalf of the Trust to recover proceeds from certain historical insurance assets, including policies issued by certain insurance carriers that were not participating in the settlement, the rights to which would have been assigned to the Trust by PPG.

Under the proposed 2002 PPG Settlement Arrangement, PPG’s participating historical insurance carriers would have made cash payments to the Trust of approximately \$1.7 billion between the Effective Date and 2023. These payments could also have been prepaid to the Trust at any time at a discount rate of 5.5% per annum as of the prepayment date. In addition, as referenced above, PPG would have assigned to the Trust its rights, insofar as they related to the asbestos claims to have been resolved by the Trust, to the proceeds of policies issued by certain insurance carriers that were not participating in the 2002 PPG Settlement Arrangement and from the estates of insolvent insurers and state insurance guaranty funds.

Under the proposed 2002 PPG Settlement Arrangement, PPG would have granted asbestos releases to all participating insurers, subject to a coverage-in-place agreement with certain insurers for the continuing coverage of premises claims (discussed below). PPG would have granted certain participating insurers full policy releases on primary policies and full product liability releases on excess coverage policies. PPG would have also granted certain other participating excess insurers credit against their product liability coverage limits.

If the second amended PC plan of reorganization incorporating the terms of the 2002 PPG Settlement Arrangement and the 2003 Corning Settlement Arrangement had been approved by the Bankruptcy Court, the Court would have entered a channeling injunction under §524(g) and other provisions of the Bankruptcy Code, prohibiting present and future claimants from asserting bodily injury claims after the Effective Date against PPG or its subsidiaries or PC relating to the manufacture, distribution or sale of asbestos-containing products by PC or PPG or its subsidiaries. The injunction would have also prohibited codefendants in those cases from asserting claims against PPG for contribution,

indemnification or other recovery. All such claims would have been filed with the Trust and only paid from the assets of the Trust.

Modified Third Amended PC Plan of Reorganization

To address the issues raised by the Bankruptcy Court in its December 2006 ruling, the interested parties engaged in extensive negotiations regarding the terms of a third amended PC plan of reorganization, including modifications to the 2002 PPG Settlement Arrangement. A modified third amended PC plan of reorganization (the “third amended PC plan of reorganization”), including a modified PPG settlement arrangement (the “2009 PPG Settlement Arrangement”), was filed with the Bankruptcy Court on January 29, 2009. The parties also filed a disclosure statement describing the third amended PC plan of reorganization with the court. The third amended PC plan of reorganization also includes a modified settlement arrangement of Corning Incorporated.

Several creditors and other interested parties filed objections to the disclosure statement. Those objections were overruled by the Bankruptcy Court by order dated July 6, 2009 approving the disclosure statement. The third amended PC plan of reorganization and disclosure statement were then sent to creditors, including asbestos claimants, for voting. The report of the voting agent, filed on February 18, 2010, revealed that all voting classes, including asbestos claimants, voted overwhelmingly in favor of the third amended PC plan of reorganization, which included the 2009 PPG Settlement Arrangement. In light of the favorable vote on the third amended PC plan of reorganization, the Bankruptcy Court conducted a hearing regarding the fairness of the proposed plan, including whether (i) the plan would be fair with respect to present and future claimants, (ii) such claimants would be treated in substantially the same manner, and (iii) the protection provided to PPG and its participating insurers would be fair in view of the assets they would convey to the Trust to be established as part of the third amended PC plan of reorganization. The hearing was held in June of 2010. The remaining objecting parties (a number of objections were resolved through plan amendments and stipulations filed before the hearing) appeared at the hearing and presented their cases. At the conclusion of the hearing, the Bankruptcy Court established a briefing schedule for its consideration of confirmation of the plan and the objections to confirmation. That briefing was completed and final oral arguments held in October 2010. On June 16, 2011 the Bankruptcy Court issued a decision denying confirmation of the third amended PC plan of reorganization.

Following the June 16, 2011 ruling, the third amended PC plan of reorganization was the subject of negotiations among the parties in interest, amendments, proposed amendments and hearings. PC then filed an amended PC plan of reorganization on August 17, 2012. Objections to the plan, as amended, were filed by three entities. One set of objections was resolved by PC, and another set merely restated for appellate purposes objections filed by a party that the Bankruptcy Court previously overruled. The Bankruptcy Court heard oral argument on the one remaining set of objections filed by the remaining affiliated insurer objectors on October 10, 2012. At the conclusion of that argument, the Bankruptcy Court set forth a schedule for negotiating and filing language that would resolve some, but not all, of the objections to confirmation advanced by the insurer objectors. On October 25, 2012, PC filed a notice regarding proposed confirmation order language that resolved those specific objections. Following additional hearings and status conferences, technical amendments to the PC plan of reorganization were filed on May 15, 2013. On May 16, 2013, the Bankruptcy Court issued a memorandum opinion and interim order confirming the PC plan of reorganization, as amended, and setting forth a schedule for motions for reconsideration. Following the filing of motions for reconsideration, the Bankruptcy Court, on May 24, 2013, issued a revised memorandum opinion and final order confirming the modified third amended plan of reorganization and issuing the asbestos permanent channeling injunction. The remaining insurer objectors filed a motion for reconsideration on June 6, 2013. On November 12, 2013, the Bankruptcy Court issued an order granting in part (by clarifying the scope of the channeling injunction in accordance with the agreement of the parties as expressed at the time of final argument on the motion for reconsideration) and otherwise denying the motion for reconsideration. Notices of appeal to the U. S. District Court for the Western District of Pennsylvania were filed by the remaining objecting parties. On March 17, 2014, the appeal of the remaining non-insurer objecting party was dismissed voluntarily, leaving only two affiliated insurance companies as appellants.

On September 30, 2014, the District Court issued a memorandum opinion and order affirming the confirmation order. On October 28, 2014, the remaining insurance company objectors filed a Notice of Appeal to the U.S. Third Circuit

Court of Appeals challenging the affirmance order. In addition to the notice of appeal, the objecting insurers filed a motion with the District Court, which was opposed by PPG and the other plan proponents and plan supporters, that sought relief from the confirmation order based on alleged misconduct by members of the plaintiffs' bar in the prosecution of certain asbestos claims in the tort system. On August 12, 2015, the District Court denied that motion. The objecting insurers filed a Notice of Appeal with the U.S. Third Circuit Court of Appeals challenging this decision as well. The two appeals were subsequently consolidated for disposition by the Court of Appeals. The Court of Appeals dismissed both appeals, by agreement of the parties, on January 7, 2016. During February 2016, the Bankruptcy Court entered an order approving the trustees of the Trust. Also in February, a motion to approve technical amendments to the PC plan

of reorganization was filed. No objections to that motion were filed, and the Bankruptcy Court granted the motion on March 24, 2016.

On April 26, 2016, PC filed a notice advising the Bankruptcy Court that all conditions precedent set forth in Section 8.2 of the third amended PC Plan of reorganization had been waived or satisfied and that the effective date would occur on April 27, 2016. As a result, PPG's initial contributions were due on or before June 9, 2016 (the "Funding Effective Date").

Asbestos Claims Subject to Bankruptcy Court's Channeling Injunction

The Bankruptcy Court's channeling injunction, entered under §524(g) of the Bankruptcy Code prohibits present and future claimants from asserting asbestos claims against PC. With regard to PPG, the channeling injunction by its terms prohibits present and future claimants from asserting claims against PPG that arise, in whole or in part, out of exposure to Unibestos, or any other asbestos or asbestos-containing products manufactured, sold and/or distributed by PC, or asbestos on or emanating from any PC premises. The injunction by its terms also prohibits codefendants in these cases that are subject to the channeling injunction from asserting claims against PPG for contribution, indemnification or other recovery. Such injunction also precludes the prosecution of claims against PPG arising from alleged exposure to asbestos or asbestos-containing products to the extent that a claimant is alleging or seeking to impose liability, directly or indirectly, for the conduct of, claims against or demands on PC by reason of PPG's: (i) ownership of a financial interest in PC; (ii) involvement in the management of PC, or service as an officer, director or employee of PC or a related party; (iii) provision of insurance to PC or a related party; or (iv) involvement in a financial transaction affecting the financial condition of PC or a related party. The foregoing PC related claims are referred to as "PC Relationship Claims" and constitute, in PPG management's opinion, the vast majority of the pending asbestos personal injury claims against PPG. All claims channeled to the Trust will be paid only from the assets of the Trust.

Asbestos Claims Retained by PPG

The channeling injunction does not extend to any claim against PPG that arises out of exposure to any asbestos or asbestos-containing products manufactured, sold and/or distributed by PPG or its subsidiaries, or for which they are otherwise alleged to be liable, that is not a PC Relationship Claim, and in this respect differs from the channeling injunction contemplated by the second amended PC plan of reorganization filed in 2003. While management believes that the vast majority of the approximately 114,000 claims against PPG alleging personal injury from exposure to asbestos relate to products manufactured, distributed or sold by PC, the potential liability for any non-PC Relationship Claims is retained by PPG. Because a determination of whether an asbestos claim is a non-PC Relationship Claim would typically not be known until shortly before trial and because the filing and prosecution of asbestos claims (other than certain premises claims) against PPG had been enjoined since April 2000, the actual number of non-PC Relationship Claims that may be pending at the expiration of the stay or the number of additional claims that may be filed against PPG in the future cannot be determined at this time. PPG intends to defend against all such claims vigorously and their ultimate resolution in the court system is expected to occur over a period of years.

In addition, similar to what was contemplated by the second amended PC plan of reorganization, the channeling injunction does not extend to claims against PPG alleging personal injury caused by asbestos on premises owned, leased or occupied by PPG (so called "premises claims"), which generally had been subject to the stay imposed by the Bankruptcy Court, although motions to lift the stay as to individual premises claims have been granted from time to time. Historically, a small proportion of the claims against PPG and its subsidiaries have been premises claims, and based upon review and analysis, PPG believes that the number of premises claims currently comprises less than 2% of the total asbestos related claims against PPG. Beginning in late 2006, the Bankruptcy Court lifted the stay with respect to certain premises claims against PPG. As a result, PPG and its primary insurers have settled approximately 580 premises claims. PPG's insurers agreed to provide insurance coverage for a major portion of the payments made in connection with the settled claims, and PPG accrued the portion of the settlement amounts not covered by insurance. Primarily as a result of motions practice in the Bankruptcy Court with respect to the application of the stay to premises claims, PPG faces approximately 250 active premises claims. PPG is currently engaged in the process of settling or otherwise resolving approximately 45 of these claims. Of the remaining 205 active premises claims, approximately 115 such claims have been initiated in lawsuits filed in various state courts, primarily in Louisiana, West Virginia,

Ohio, Illinois, and Pennsylvania, and are the subjects of active litigation and are being defended by PPG. PPG believes that any financial exposure resulting from such premises claims, taking into account available insurance coverage, will not have a material adverse effect on PPG's consolidated financial position, liquidity or results of operations.

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PPG's Funding Obligations

On April 26, 2016, PPG's equity interest in PC was canceled. On the Funding Effective Date, PPG conveyed the stock it owned in Pittsburgh Corning Europe ("PCE") and transferred 2,777,778 shares of PPG's common stock. PPG had the right, in its sole discretion, to prepay future pre-tax cash payments to the Trust at any time at a discount rate of 5.5% per annum as of the prepayment date or \$61 million. PPG exercised that right and made a cash payment to the Trust in the amount of \$764 million on the Funding Date, thereby satisfying PPG's cash payment obligations due to the Trust on the Funding Effective Date and in the future. PPG's historical insurance carriers participating in the third amended PC plan of reorganization are required to make cash payments to the Trust of approximately \$1.7 billion between the Funding Effective Date and 2027. These payments can also be prepaid to the Trust at any time at a discount rate of 5.5% per annum as of the prepayment date. PPG granted asbestos releases and indemnifications to all participating insurers, subject to amended coverage-in-place arrangements with certain insurers for remaining coverage of premises claims. PPG granted certain participating insurers full policy releases on primary policies and full product liability releases on excess coverage policies. PPG also granted certain other participating excess insurers credit against their product liability coverage limits.

PPG's obligation under the 2009 PPG Settlement Arrangement at December 31, 2008 was \$162 million less than the amount that would have been due under the 2002 PPG Settlement Arrangement. This reduction is attributable to a number of negotiated provisions in the 2009 PPG Settlement Arrangement, including the provisions relating to the channeling injunction under which PPG retains liability for any non-PC Relationship Claims. PPG will retain such amount as a reserve for asbestos-related claims that will not be channeled to the Trust, as this amount represents PPG's best estimate of its liability for these claims. PPG does not have sufficient current claim information or settlement history on which to base a better estimate of this liability, in light of the fact that the Bankruptcy Court's stay has been in effect since 2000. As a result, PPG's reserve at June 30, 2016 and December 31, 2015 for asbestos-related claims that will not be channeled to the Trust is \$162 million. This amount is included within "Other liabilities" on the accompanying consolidated balance sheets. In addition, under the 2009 PPG Settlement Arrangement, PPG will retain for its own account rights to recover proceeds from certain historical insurance assets, including policies issued by non-participating insurers. Rights to recover these proceeds would have been assigned to the Trust by PPG under the 2002 PPG Settlement Arrangement.

Following the effective date of the third amended PC plan of reorganization, as amended, and the lifting of the Bankruptcy Court stay, PPG will monitor the activity associated with asbestos claims which are not channeled to the Trust pursuant to the third amended PC plan of reorganization, and evaluate its estimated liability for such claims and related insurance assets then available to the Company as well as underlying assumptions on a periodic basis to determine whether any adjustment to its reserve for these claims is required.

On June 9, 2016, PPG fully funded its portion of the Trust that was established by the U.S. Bankruptcy Court for the Western District of Pennsylvania in May 2016. The following table outlines the impact on PPG's financial statements for the six months ended June 30, 2016 including the change in fair value of the PPG stock contributed to the Trust and the equity forward instrument and the increase in the net present value of the payments made to the trust.

(\$ in millions)	Consolidated Balance Sheet				
	Asbestos Settlement Liability		Equity Forward (Asset) Liability	Pre-tax Charge (Income)	Cash Outflow
	Current	Long-term			
Balances as of December 31, 2015	\$ 796	252	(223)	—	—
2016 Activity					
Change in fair value:					
PPG stock	34	—	—	34	—
Equity forward instrument	—	—	(35)	(35)	—
Accretion of asbestos liability	—	6	—	6	—
Settlement of equity forward instrument with counterparty	—	—	(49)	—	(49)
Contribution of PCE shares and relinquishment of PC investment	(15)	—	—	—	—

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Contribution of 2,777,778 shares of PPG stock to the PC Trust	(308)	—	308	—	—
Contribution of cash to the PC Trust	(506)	(258)	—	—	(764)
Reclassifications	(1)	—	(1)	—	—
Balance as of and Activity for the six months ended June 30, 2016	\$ —	\$ —	\$ —	\$ 5	\$ (813)

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Environmental Matters

It is PPG's policy to accrue expenses for environmental contingencies when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Reserves for environmental contingencies are exclusive of claims against third parties and are generally not discounted. In management's opinion, the Company operates in an environmentally sound manner and the outcome of the Company's environmental contingencies will not have a material 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. Management anticipates that the resolution of the Company's environmental contingencies will occur over an extended period of time. See Note 13, "Commitments and Contingent Liabilities," under Item 8 of the 2015 Form 10-K for additional description of the following environmental matters.

As of June 30, 2016 and December 31, 2015, PPG had reserves for environmental contingencies associated with PPG's former chromium manufacturing plant in Jersey City, N.J. and associated sites ("New Jersey Chrome") and for other environmental contingencies, including National Priority List sites and legacy glass and chemical manufacturing sites. These reserves are reported as "Accounts payable and accrued liabilities" and "Other liabilities" in the accompanying condensed consolidated balance sheet.

Environmental Reserves

(\$ in millions)	June 30, 2016	December 31, 2015
New Jersey Chrome	\$ 121	\$ 133
Other	97	100
Total	\$ 218	\$ 233
Current portion	\$ 57	\$ 51

Pre-tax charges against income for environmental remediation costs are included in "Other charges" in the accompanying condensed consolidated statement of income. The pre-tax charges and cash outlays related to such environmental remediation for the three and six months ended June 30, 2016 and 2015 were as follows:

(\$ in millions)	Three Months Ended June 30 2016		Six Months Ended June 30 2015	
Environmental remediation pre-tax charges	\$ 3	\$ 1	8	6
Cash outlays for environmental remediation activities	\$ 9	\$ 20	23	56

Remediation: New Jersey Chrome

In June 2009, PPG entered into a settlement agreement with the New Jersey Department of Environmental Protection ("NJDEP") and Jersey City (which had asserted claims against PPG for lost tax revenue) which was in the form of a Judicial Consent Order (the "JCO"). Under the JCO, PPG accepted sole responsibility for the remediation activities at its former chromium manufacturing location in Jersey City, New Jersey and 19 additional sites. The principal contaminant of concern is hexavalent chromium. The JCO also provided for the appointment of a court-approved Site Administrator who is responsible for establishing a master schedule for the remediation of the 20 PPG sites which existed at that time. One site was subsequently removed from the JCO process during 2014 and will be remediated separately at a future date. A total of 19 sites remain subject to the JCO process.

The most significant assumptions underlying the estimate of remediation costs for all New Jersey Chrome sites are those related to the extent and concentration of chromium impacts in the soil, as these determine the quantity of soil that must be treated in place, the quantity that will have to be excavated and transported for offsite disposal, and the nature of disposal required. The reserve for the estimated costs to remediate all New Jersey Chrome sites are exclusive of any third party indemnification, as the recovery of any such amounts is uncertain.

Groundwater remediation at PPG's former chromium manufacturing site in Jersey City and five adjacent sites is expected to occur over several years after NJDEP's approval of a work plan. Ongoing groundwater monitoring will be

utilized to develop a final groundwater remedial action work plan which is currently expected to be submitted to NJDEP no later than 2020.

PPG's financial reserve for remediation of all New Jersey Chrome sites is \$121 million at June 30, 2016. The major cost components of this liability continue to be related to transportation and disposal of impacted soil, as well as

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construction services. These components each account for approximately 32% and 40% of the accrued amount, respectively.

There are multiple, future events yet to occur, including further remedy selection and design, remedy implementation and execution and applicable governmental agency or community organization approvals. Considerable uncertainty exists regarding the timing of these future events for the New Jersey Chrome sites. Final resolution of these events is expected to occur over the next several years. As these events occur and to the extent that the cost estimates of the environmental remediation remedies change, the existing reserve for this environmental remediation matter will be adjusted.

Remediation: Other Legacy Sites

Among other sites at which PPG is managing environmental liabilities, remedial actions are occurring at a legacy chemical manufacturing site in Barberton, Ohio and legacy plate glass manufacturing sites near Ford City, Pennsylvania and in Kokomo, Indiana. With respect to certain waste sites where PPG is alleged to have contributed contaminants, the financial condition of other potentially responsible parties contributes to the uncertainty of estimating PPG's final costs. Although contributors of waste to sites involving other potentially responsible parties may face governmental agency assertions of joint and several liability, in general, final allocations of costs are made based on the relative contributions of wastes to such sites. PPG is generally not a major contributor to such sites.

In March 2016, the Natural Resource Trustees for the Calcasieu River Estuary (Louisiana Department of Environmental Quality, The United States Environmental Protection Agency and the United States Department of the Interior) reached an agreement in principle with PPG and two other potentially responsible parties to resolve the Trustees' claims for natural resource damages alleged to have been caused by the release of hazardous substances into the Estuary. PPG's share of this settlement is estimated to be approximately \$3.6 million, for which a reserve has been established.

Remediation: Reasonably Possible Matters

In addition to the amounts currently reserved for environmental remediation, the Company may be subject to loss contingencies related to environmental matters estimated to be as much as \$75 million to \$200 million. Such unreserved losses are reasonably possible but are not currently considered to be probable of occurrence. These reasonably possible unreserved losses relate to environmental matters at a number of sites. 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.

The impact of evolving programs, such as natural resource damage claims, industrial site re-use initiatives and domestic and international remediation programs, also adds to the present uncertainties with regard to the ultimate resolution of this unreserved exposure to future loss. The Company's assessment of the potential impact of these environmental contingencies is subject to considerable uncertainty due to the complex, ongoing and evolving process of investigation and remediation, if necessary, of such environmental contingencies, and the potential for technological and regulatory developments.

Other Matters

The Company had outstanding letters of credit and surety bonds of \$175 million and guarantees of \$19 million as of June 30, 2016. The Company does not believe any loss related to such guarantees is likely.

16. Reportable Business Segment Information

PPG is a multinational manufacturer with 11 operating segments that are organized based on the Company's major product lines. These operating segments are also the Company's reporting units for purposes of testing goodwill for impairment. The operating segments have been aggregated based on economic similarities, the nature of their products, production processes, end-use markets and methods of distribution into three reportable business segments. The Performance Coatings reportable segment is comprised of the refinish, aerospace, architectural coatings – Americas and Asia Pacific, architectural coatings - EMEA, and protective and marine coatings operating segments. This reportable segment primarily supplies a variety of protective and decorative coatings, sealants and finishes along with paint strippers, stains and related chemicals, as well as transparencies and transparent armor.

The Industrial Coatings reportable segment is comprised of the automotive original equipment manufacturer ("OEM") coatings, industrial coatings, packaging coatings, and the specialty coatings and materials operating segments. This

reportable segment primarily supplies a variety of protective and decorative coatings and finishes along with adhesives, sealants, metal pretreatment products, optical monomers and coatings, precipitated silicas, Teslin® and other specialty materials.

The Glass reportable segment is comprised of the flat glass and fiber glass operating segments. This reportable segment primarily supplies flat glass and continuous-strand fiber glass products.

Reportable segment net sales and segment income for the three and six months ended June 30, 2016 and 2015 were as follows:

(\$ in millions)	Three Months		Six Months	
	Ended		Ended	
	June 30		June 30	
	2016	2015	2016	2015
Net sales:				
Performance Coatings	\$2,338	\$2,410	\$4,377	\$4,465
Industrial Coatings	1,444	1,411	2,816	2,751
Glass	282	279	543	546
Total	\$4,064	\$4,100	\$7,736	\$7,762
Segment income:				
Performance Coatings	\$428	\$411	\$707	\$673
Industrial Coatings	292	260	557	504
Glass	43	37	71	67
Total	763	708	1,335	1,244
Corporate	(59)	(65)	(120)	(132)
Interest expense, net of interest income	(24)	(24)	(48)	(42)
Legacy items ^(a)	(10)	(6)	(20)	(18)
Asset write-downs	(10)	—	(14)	—
Gain from sale of equity affiliate	20	—	20	—
Transaction-related costs ^(b)	(7)	(21)	(9)	(30)
Business restructuring	—	(140)	—	(140)
Income from continuing operations before income taxes	\$673	\$452	\$1,144	\$882

Legacy items include current costs related to former operations of the Company, including pension and other postretirement benefit costs, certain charges for legal matters and environmental remediation costs, and certain (a) other charges which are not associated with PPG's current business portfolio, including the impact of the asbestos settlement. Until April 2016, legacy items also include equity earnings from PPG's minority investment in Pittsburgh Glass Works, LLC.

Transaction-related costs include advisory, legal, accounting, valuation and other professional or consulting fees incurred to effect significant acquisitions, as well as similar fees and other costs to effect disposals not classified as (b) discontinued operations. These costs also include the flow-through cost of sales for the step up to fair value of inventories acquired in acquisitions. These costs also include certain severance costs and charges associated with the Company's recent business portfolio transformation.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Executive Overview

Below are our key financial results for the three months ended June 30, 2016:

Net sales for the three months ended were \$4.1 billion, down less than one percent compared to the prior year, primarily due to unfavorable foreign currency translation (-2%) offset by sales from acquired businesses (+1%).

Net sales for the six months ended were \$7.7 billion, consistent with the prior year, primarily due to sales from acquired businesses (+2%) and higher sales volumes, offset by unfavorable foreign currency translation (-3%).

Cost of sales, exclusive of depreciation and amortization was \$2.2 billion, down 4.1% for the three months ended June 30, 2016 and was \$4.2 billion, down 3.3% for the six months ended June 30, 2016.

Selling, general and administrative ("SG&A") expenses was \$1.0 billion, down 0.2% for the three months ended June 30, 2016 and was \$1.9 billion, down 0.4% for the six months ended June 30, 2016. As a percentage of sales, SG&A increased 0.2% and 0.1% for the three and six months ended June 30, 2016, respectively.

Income before income taxes was \$673 million and \$1.1 billion for the three and six months ended June 30, 2016, respectively.

The effective tax rate for the three months and six months ended June 30, 2016 was 44.1% and 36.2%, respectively.

Net income from continuing operations was \$370 million and \$717 million for the three and six months ended June 30, 2016, respectively.

Earnings per diluted share was \$1.37 and \$2.66 for the three and six months ended June 30, 2016, respectively.

Cash flows from operating activities decreased \$211 million year over year for the six months ended June 30, 2016.

Operating cash flow decreased primarily due to funding of the asbestos settlement trust (\$813 million) and higher cash tax payments (\$27 million) partially offset by lower working capital (\$376 million) and lower pension contributions (\$270 million).

Capital expenditures, including acquisitions (net of cash acquired), was \$178 million for the six months ended June 30, 2016.

During the six months ended June 30, 2016, the Company paid \$203 million in dividends and also repurchased approximately \$150 million of its outstanding common stock. On April 21, 2016, the Company raised the per-share dividend by 11% to \$0.40 per share.

Performance in the Second Quarter of 2016 Compared to the Second Quarter of 2015

Performance Overview

Net Sales

	Three Months Ended		Percent Change
	June 30		
(\$ in millions, except percentages)	2016	2015	2016 vs. 2015
The Americas			
United States and Canada	\$1,918	\$1,960	(2.1)%
Latin America	344	367	(6.3)%
Europe, Middle East and Africa (EMEA)	1,203	1,158	3.9 %
Asia-Pacific	599	615	(2.6)%
Total	\$4,064	\$4,100	(0.9)%

2016 vs. 2015

Net sales decreased \$36 million due to the following:

Foreign currency translation (-2%)

Partially offset by:

Net sales attributable acquired businesses (+1%)

Foreign currency translation reduced net sales by \$92 million as the U.S. dollar strengthened against most foreign currencies versus the prior year, notably the Mexican Peso, Chinese Yuan, British Pound, Canadian Dollar and certain emerging region currencies. These were partially offset by modest strengthening of the Euro versus the U.S. Dollar. Acquired businesses added \$64 million of sales in 2016, primarily IVC, supplemented by several other acquisitions made in 2015.

In the U.S. and Canada region, sales volumes declined reversing an improving trend over the prior three sequential quarters. Results were mixed by business unit with growth in packaging, general industrial, and automotive refinish coatings offset by declines in architectural and automotive OEM coatings.

Sales volume growth occurred primarily in EMEA led by strong growth in automotive OEM, general industrial, packaging and aerospace coatings. Architectural coatings - EMEA experienced modest volume declines, primarily due to unfavorable weather patterns, including flooding, across portions of western Europe. The second quarter 2016 was the sixth consecutive quarter of broad-based sales volume growth in the EMEA region.

Sales volume growth in Asia-Pacific accelerated in comparison to the first quarter of 2016 results, with solid volume gains in most businesses, including automotive OEM and refinish, general industrial and packaging coatings. From a country perspective, China, India and Australia grew sales volumes versus the prior year, with Korean volumes declining primarily due to lower marine shipbuilding activity.

In Latin America, sales volumes grew in aggregate led by architectural and packaging coatings. Within the region, sales volumes continued to grow in Mexico and Central America and declined in Brazil due to weak overall economic conditions.

Cost of Sales, exclusive of depreciation and amortization

	Three Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
Cost of sales, exclusive of depreciation and amortization	\$2,190	\$2,283	(4.1)%
Cost of sales as a percentage of net sales 2016 vs. 2015	53.9 %	55.7 %	(1.8)%

Cost of sales, exclusive of depreciation and amortization, decreased \$93 million (-4.1%) including the following:

Foreign currency translation

Lower manufacturing costs

Partially offset by:

Cost of sales attributable to acquired businesses

Selling, general and administrative expenses

	Three Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
Selling, general and administrative expenses	\$956	\$954	0.2 %
Selling, general and administrative expenses as a percentage of net sales 2016 vs. 2015	23.5 %	23.3 %	0.2 %

SG&A increased \$2 million (+0.2%) due to the following:

SG&A expenses attributable to acquired businesses

Overhead cost inflation

Partially offset by:

Foreign currency translation

Restructuring cost savings

Lower stock-based compensation expense

Other costs and income

	Three Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
Interest expense, net of Interest income	\$24	\$24	— %
Other charges	\$32	\$34	(5.9)%
Other income	\$(53)	\$(38)	39.5 %
Other income			

Other income for the three months ended June 30, 2016 includes a \$20 million pre-tax gain on the sale of PPG's ownership interest in an equity affiliate investment, offset by lower equity affiliate income and lower royalty income.

Effective tax rate and earnings per diluted share

	Three Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
Income tax expense	\$297	\$110	170.0 %
Effective tax rate	44.1 %	24.3 %	19.8 %
Adjusted effective tax rate, continuing operations*	25.0 %	24.5 %	0.5 %
Earnings per diluted share, continuing operations	\$1.37	\$1.23	11.4 %
Adjusted earnings per diluted share*	\$1.85	\$1.67	10.8 %

*See Regulation G Reconciliation.

The full year effective tax rate for 2016 is expected to be higher as a result from a shift in PPG's global mix of earnings toward jurisdictions with higher statutory tax rates, due in part to recent acquisitions. Tax expense for the three months ended June 30, 2016 includes a net tax charge of \$128 million associated with PPG's funding of the Pittsburgh Corning asbestos settlement trust. Refer to Note 9, "Income Taxes" for a discussion of the tax charge. Earnings per diluted share for the three months ended June 30, 2016 grew year-over-year from 2015. The Company benefited from the 7.0 million shares repurchased in 2015 and 1.5 million shares repurchased in the first quarter of 2016.

Regulation G Reconciliation - Results from Operations

PPG Industries believes investors' understanding of the company's operating performance is enhanced by the disclosure of net income, earnings per diluted share and the effective tax rate adjusted for certain charges. PPG's management considers this information useful in providing insight into the company's ongoing operating performance because it excludes the impact of items that cannot reasonably be expected to recur on a quarterly basis or that are not attributable to our primary operations. Net income and earnings per diluted share adjusted for these items are not recognized financial measures determined in accordance with U.S. generally accepted accounting principles (GAAP) and should not be considered a substitute for net income or earnings per diluted share or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, earnings per diluted share and the effective tax rate may not be comparable to similarly titled measures as reported by other companies.

Income before income taxes is reconciled to adjusted income before income taxes, the effective tax rate from continuing operations is reconciled to the adjusted effective tax rate from continuing operations and net income (attributable to PPG) and earnings per share – assuming dilution (attributable to PPG) are reconciled to adjusted net income (attributable to PPG) and adjusted earnings per share – assuming dilution below:

(\$ in millions, except percentages and per share amounts)	Three months ended June 30, 2016					
	Income Before Tax	Income Taxes	Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share
As reported, continuing operations	\$673	\$297		44.1 %	\$370	\$1.37
Adjusted for:						
Gain from sale of equity investment	(20)	(7)		37.6 %	(13)	(0.05)
Transaction-related costs ⁽¹⁾	7	2		37.6 %	5	0.02
Net tax effect of asbestos settlement funding	—	(128)		N/A	128	0.48
Asset write-downs	10	3		25.0 %	8	0.03
Adjusted, continuing operations, excluding certain charges	\$670	\$167		25.0 %	\$498	\$1.85

(\$ in millions, except percentages and per share amounts)	Three months ended June 30, 2015					
	Income Before Tax	Income Taxes	Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share
As reported, continuing operations	\$452	\$110		24.3 %	\$337	\$1.23
Adjusted for:						
Transaction-related costs ⁽¹⁾	21	6		28.6 %	15	0.05
Business restructuring	140	34		24.3 %	106	0.39
Adjusted, continuing operations, excluding certain charges	\$613	\$150		24.5 %	\$458	\$1.67

(1) Transaction-related costs include advisory, legal, accounting, valuation, and other professional or consulting fees incurred to effect significant acquisitions, as well as similar fees and other costs to effect disposals not classified as discontinued operations. These costs also include the flow-through cost of sales for the step up to fair value of inventories acquired in acquisitions. These costs also include certain charges associated with the Company's business portfolio transformation.

Performance of Reportable Business Segments

Performance Coatings

	Three Months Ended June 30		\$	%
	2016	2015	Change	Change
(\$ in millions, except per share amounts)			2016 vs. 2015	2016 vs. 2015
Net sales	\$2,338	\$2,410	\$ (72)	(3.0)%
Segment income	\$428	\$411	\$ 17	4.1 %

2016 vs. 2015

Performance Coatings net sales decreased (-3%) due to the following:

- Unfavorable foreign currency translation of approximately \$60 million (-2%)

- Lower sales volumes (-2%)

Partially offset by:

- Net sales from acquisitions (+1%)

- Slightly higher selling prices

Architectural coatings - EMEA sales volumes declined by a low-single-digit percentage year-over-year, after achieving improved volumes over the prior three sequential quarters. The modest decline in the quarter is primarily due to unfavorable weather patterns, including flooding across portions of western Europe. Sales volumes remained mixed across the region and by month.

Architectural coatings - Americas and Asia-Pacific organic net sales decreased a mid-single-digit percentage in the second quarter versus the prior year. Sales volumes declined considerably in Brazil and China, with both countries declining more than 20 percent, reflecting regional end-use market weakness. Local currency architectural coatings sales growth in Mexico was more than double the country's GDP growth due to continued market penetration and over 100 new store openings year-to-date. Additionally, architectural coatings sales continued to expand in Central America, up a high-double digit percentage, as the Company continues to leverage the Comex and Consorcio Latinoamericano acquisitions and is successfully establishing a presence in the region. In the U.S. and Canada region, company-owned store volumes increased modestly but were more than offset by contraction in the independent dealer channel. In aggregate, national retail accounts (DIY) sales volumes were lower year-over-year due to a comparison against solid volume growth in the second quarter of 2015, along with current year initiatives by a DIY customer to structurally and permanently lower inventory balances. Overall sales of PPG products to DIY consumers, or "out-the-door" sales were positive year over year.

Protective and marine coatings sales volumes declined by a low-single-digit percentage year-over-year as growth in protective coatings was offset by declines in marine coatings, primarily due to lower new ship-building activity and the ongoing impact of decreased capital investment and maintenance in the oil and gas sector. Year-over-year sales volumes declined in all regions except Latin America which improved primarily due to acquisition-related sales synergies of legacy PPG products through the Comex concessionaire network.

Aerospace coatings returned to sales volumes growth increasing by a low-single digit percentage versus the prior year. Regionally, sales volume growth was the largest in Asia-Pacific and Europe, while U.S. volumes were flat.

Automotive refinish coatings organic sales grew at a mid-single-digit percentage rate year-over-year, outperforming end-use market demand levels in the U.S. and Canada and the Asia-Pacific regions.

Segment income increased \$17 million (+4%) year-over-year despite the impact of lower sales volumes in the U.S. and Canada. The increase in segment income was primarily due to acquisition-related income and a continued strong cost management, including additional business restructuring benefits. Unfavorable foreign currency translation reduced segment income by \$10 million.

Looking Ahead

In the third quarter, we expect lower quarterly sales sequentially due to normal seasonal business patterns, as the second quarter is historically the strongest period of the year in most business units. From a strategic business unit perspective, we expect automotive refinish coatings trends to continue in the third quarter, led by sustained high

adoption levels of PPG's leading waterborne technologies and higher aggregate global end-use market demand. For aerospace coatings, we expect a continuation of year-over-year sales volume improvement in the third quarter. We expect positive sales volume growth to return to architectural coatings - EMEA in the third quarter, but remain uneven by country. For the architectural coatings - Americas and Asia Pacific business, we expect year-over-year sales volumes to improve notably in the U.S. and Canada region in the third quarter, as various growth initiatives which have been underway for the past year begin to provide tangible results. We expect above-market performance to continue in Mexico and Central America. We also anticipate a return to very modest overall growth in protective and marine coatings led by a stabilization of protective coatings demand due to a leveling of oil and

gas sector demand activity, partially offset by further weakness in marine new build coatings. We expect acquisition sales to be \$15 million to \$20 million, primarily related to Sealants Europe SAS. Unfavorable foreign currency translation impacts will remain sizable year-over-year.

Industrial Coatings

	Three Months		\$	%	
	Ended					Change	Change
	June 30				
(\$ in millions, except per share amounts)	2016	2015	2016 vs.	2016 vs.	
			2015	2015	
Net sales	\$1,444	\$1,411	\$ 33	2.3	%
Segment income	\$292	\$260	\$ 32	12.3	%

2016 vs. 2015

Industrial Coatings segment net sales increased (+2%) due to the following:

- Net sales attributable to acquired businesses (+3%)

- Higher sales volumes (+3%), led by growth in Europe and Asia Pacific.

Partially offset by:

- Unfavorable foreign currency translation of approximately \$30 million (-2.5%)

- Lower selling prices

PPG's global automotive OEM coatings business sales volumes increased by a low-single-digit percentage versus the prior year, consistent with industry rates, reflecting moderate global automotive industry production growth. PPG's sales volumes differed by region, led by growth in Europe and Asia, partially offset by declines in North America.

Global industrial and specialty coatings and materials sales volumes, in aggregate, grew a low-to-mid-single-digit percentage year-over-year outpacing global industrial production, and continued to improve on positive growth trends in the prior two sequential quarters led by expansion in Europe and Asia-Pacific. By end-use market, volume growth remained mixed with improved demand in automotive parts and accessories and expansion in coil and extrusion, partially offset by declines in heavy duty equipment.

Packaging coatings sales volumes were up a high single-digit percentage year-over-year, well above market, including growth in all regions, driven by continued strong sales growth momentum related to the adoption of new PPG can coatings technologies.

Segment income increased \$32 million (+12%) primarily due to lower manufacturing costs including business restructuring benefits, higher sales volumes and acquisition-related income, partially offset by unfavorable foreign currency translation (\$5 million).

Looking ahead

Looking forward, we expect 2016 third quarter net sales to be modestly lower sequentially versus the second quarter due to normal business seasonality. Automotive OEM aggregate sales volumes are expected to increase modestly in the third quarter versus prior year. Growth will remain varied by region, with the highest year-over-year industry build growth in Asia, where Chinese industry volumes declined in the prior year period. Overall global automotive industry production is seasonally lower in the third quarter versus the second quarter. For global industrial and specialty coatings and materials overall end-market growth trends are expected to continue. We also expect the strong growth trends in global packaging coatings sales to continue in all regions for the remainder of 2016; however, year-over-year growth comparisons will become more challenging given the strong growth rates achieved by the business in the second half of 2015. We anticipate that acquisition-related sales will total \$75 million to \$80 million, higher than the second quarter due to the Metokote Corporation acquisition which was completed in early July 2016. Based on current exchange rates, we expect foreign currency translation to remain unfavorable year-over-year.

Glass

	Three			
	Months	\$	%	
	Ended	Change	Change	
	June 30			
(\$ in millions, except per share amounts)	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	\$282	\$279	\$ 3	1.1 %
Segment income	\$43	\$37	\$ 6	16.2 %
2016 vs. 2015				

Glass segment net sales increased (+1%) due to the following:

Higher selling prices (+3%)

Partially offset by:

Slightly lower sales volumes

Lower sales stemming from a prior year flat glass production facility divestiture (-1%)

Unfavorable foreign currency translation (-1%)

Flat glass sales volumes declined a low-single digit percentage but were more than offset by higher selling prices. The sales volume decline reflected the impact of a facility outage at the company's Fresno, California facility which returned to normal operation early in the second quarter following a major first quarter scheduled maintenance outage. Sales also declined year-over-year due to the prior year sale of remaining finished goods inventory from a previously divested flat glass manufacturing facility. Despite the lower sales volumes, underlying flat glass end-use market demand remained solid.

Fiber glass sales volumes increased modestly year-over-year in the second quarter, as higher demand for automotive components in the U.S. and Europe was partially offset by lower demand in certain U.S. energy-related end-use markets.

Segment income increased \$6 million (16%) due to higher organic sales and disciplined cost management, partially offset by \$3 million of remaining repair-related and start-up costs stemming from the Fresno facility outage and lower equity affiliate income related to weaker consumer electronics demand in Asia.

Looking ahead

For the third quarter, PPG anticipates modestly higher flat glass demand seasonally and year-over-year, driven by a return to full system-wide production capability for the third quarter, and solid end-market demand. We anticipate higher selling prices will counter increasing natural gas costs. Fiber glass end use market demand is expected to be in line with the second quarter. Based on current exchange rates, we anticipate foreign currency translation to remain slightly unfavorable year-over-year.

PPG announced the sale of its European fiber glass business and its flat glass operating segment. These transactions are expected close in the second half of 2016. During the third quarter 2016, PPG will present the results of its flat glass operating segment as discontinued operations.

Performance for the first six months of 2016 Compared to the first six months of 2015

Performance Overview

Net Sales

	Six Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
The Americas			
United States and Canada	\$3,643	\$3,657	(0.4)%
Latin America	661	725	(8.8)%
Europe, Middle East and Africa (EMEA)	2,263	2,168	4.4 %
Asia Pacific	1,169	1,212	(3.5)%
Total	\$7,736	\$7,762	(0.3)%

2016 vs. 2015

Net sales decreased \$26 million due to the following:

Unfavorable foreign currency translation (-3%)

Partially offset by:

Net sales attributable to acquired businesses (+2%)

Modestly higher sales volumes

Foreign currency translation reduced net sales by \$230 million as the U.S. dollar strengthened against most foreign currencies versus the prior year, notably the Mexican Peso, Chinese Yuan, British Pound and Canadian Dollar. These were partially offset by modest strengthening of the Euro versus the U.S. Dollar.

Acquired businesses added approximately \$170 million of sales in 2016, primarily Revocoat and IVC, supplemented by several other acquisitions made in 2015.

Sales volume growth occurred primarily in EMEA and the emerging regions, while U.S. and Canada sales volumes declined.

Cost of Sales, exclusive of depreciation and amortization

	Six Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
(\$ in millions, except percentages)			
Cost of sales, exclusive of depreciation and amortization	4,203	4,348	(3.3)%
Cost of sales as a percentage of net sales	54.3 %	56.0 %	(1.7)%

2016 vs. 2015

Cost of sales, exclusive of depreciation and amortization, decreased \$145 million (-3.3%) due to the following:

Foreign currency translation

Lower manufacturing costs, including restructuring savings

Partially offset by:

Cost of sales attributable to acquired businesses

Higher sales volumes

Selling, general and administrative expenses

(\$ in millions, except percentages)	Six Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
Selling, general and administrative expenses	1,875	1,867	0.4 %
Selling, general and administrative expenses as a percentage of net sales 2016 vs. 2015	24.2 %	24.1 %	0.1 %

SG&A expenses increased \$8 million (+0.4%) due to the following:

SG&A expenses attributable to acquired businesses

Overhead cost inflation

Increased architectural coatings U.S. and Canada business spending of approximately \$15 million on new product launches and other growth-related initiatives at major national accounts.

Partially offset by:

Foreign currency translation

Restructuring cost savings

Other costs and income

(\$ in millions, except percentages)	Six Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
Interest expense, net of Interest income	\$48	\$42	14.3 %
Other charges	\$53	\$59	(10.2)%
Other income	\$(71)	\$(69)	2.9 %

Interest expense, net of Interest income

Interest expense, net of Interest income increased \$6 million in 2016 versus the prior year as a result of lower interest income earned on deposits.

Other income

Other income includes a \$20 million pre-tax gain on the sale of PPG's minority ownership interest in an equity affiliate offset by lower equity affiliate income and lower royalty income.

Effective tax rate and earnings per diluted share

(\$ in millions, except percentages)	Six Months Ended June 30		Percent Change
	2016	2015	2016 vs. 2015
Income tax expense	414	214	93.5 %
Effective tax rate	36.2 %	24.3 %	11.9 %
Adjusted effective tax rate, continuing operations*	25.0 %	24.5 %	0.5 %
Earnings per diluted share, continuing operations	\$2.66	\$2.39	11.3 %
Adjusted earnings per diluted share*	\$3.16	\$2.85	10.9 %

*See Regulation G Reconciliation.

The full year effective tax rate for 2016 is expected to be higher as a result of a shift in PPG's global mix of earnings toward jurisdictions with higher statutory tax rates, due in part to recent acquisitions. Tax expense during the six months ended June 30, 2016 includes a net tax charge of \$128 million associated with the funding of the Pittsburgh Corning asbestos settlement trust. Refer to Note 9, "Income Taxes" for a discussion of the tax charge.

Earnings per diluted share for the six months ended June 30, 2016 grew year-over-year from 2015. The Company benefited from the 7.0 million shares repurchased in 2015 and 1.5 million shares repurchased in the first quarter of 2016.

Regulation G Reconciliation - Results from Operations

PPG Industries believes investors' understanding of the company's operating performance is enhanced by the disclosure of net income, earnings per diluted share and the effective tax rate adjusted for certain charges. PPG's management considers this information useful in providing insight into the company's ongoing operating performance because it excludes the impact of items that cannot reasonably be expected to recur on a quarterly basis or that are not attributable to our primary operations. Net income and earnings per diluted share adjusted for these items are not recognized financial measures determined in accordance with U.S. generally accepted accounting principles (GAAP) and should not be considered a substitute for net income or earnings per diluted share or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, earnings per diluted share and the effective tax rate may not be comparable to similarly titled measures as reported by other companies.

Income before income taxes is reconciled to adjusted income before income taxes, the effective tax rate from continuing operations is reconciled to the adjusted effective tax rate from continuing operations and net income (attributable to PPG) and earnings per share – assuming dilution (attributable to PPG) are reconciled to adjusted net income (attributable to PPG) and adjusted earnings per share – assuming dilution below:

(\$ in millions, except percentages and per share amounts)	Six months ended June 30, 2016					
	Income Before Income Taxes	Tax Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share	
As reported, continuing operations	1,144	414	36.2 %	\$ 717	\$ 2.66	
Adjusted for:						
Gain from sale of equity investment	(20)	(7)	37.6 %	(13)	(0.05)	
Transaction-related costs ⁽¹⁾	9	3	33.3 %	6	0.03	
Net tax effect of asbestos settlement funding	—	(128)	NA	128	0.48	
Asset write-downs	14	4	28.6 %	11	0.04	
Adjusted, continuing operations, excluding certain charges	\$1,147	\$ 286	25.0 %	\$ 849	\$ 3.16	

(\$ in millions, except percentages and per share amounts)	Six months ended June 30, 2015					
	Income Before Income Taxes	Tax Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share	
As reported, continuing operations	882	214	24.3 %	\$ 658	\$ 2.39	
Includes:						
Transaction-related costs ⁽¹⁾	30	10	33.3 %	21	0.07	
Business restructuring	140	34	24.3 %	106	0.39	
Adjusted, continuing operations, excluding certain charges	\$1,052	\$ 258	24.5 %	\$ 785	\$ 2.85	

(1) Transaction-related costs include advisory, legal, accounting, valuation, and other professional or consulting fees incurred to effect significant acquisitions, as well as similar fees and other costs to effect disposals not classified as discontinued operations. These costs also include the flow-through cost of sales for the step up to fair value of inventories acquired in acquisitions. These costs also include certain charges associated with the Company's business portfolio transformation.

Performance of Reportable Business Segments

Performance Coatings

	Six Months		\$	%
	Ended		Change	Change
	June 30			
(\$ in millions, except per share amounts)	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	4,377	4,465	\$ (88)	(2.0)%
Segment income	707	673	\$ 34	5.1 %

2016 vs. 2015

Performance Coatings net sales decreased (-2%) due to the following:

- Unfavorable foreign currency translation of approximately \$144 million (-3%)

- Lower sales volumes (-1%)

Partially offset by:

- Net sales attributable to acquired businesses (+1%)

- Higher selling prices (+1%)

Architectural coatings - EMEA sales volumes improved by a low-single-digit percentage year-over-year, led by growth in western Europe early in the year.

Architectural coatings - Americas and Asia Pacific organic net sales decreased a low single digit percentage in the first six months versus the prior year. In the U.S. and Canada, modest company owned store year-over-year growth was more than offset by declines in the independent dealer and national retailer channels. Local currency sales growth in Mexico grew at approximately double the Mexican GDP due to continued market penetration and over 100 new store openings year-to-date.

Protective and marine coatings net sales volumes were modestly higher year-over-year as growth in protective coatings was offset by declines in marine coatings, primarily due to lower new ship builds and the ongoing impact of decreased capital investment and maintenance in the oil and gas sector. Protective coatings sales volumes grew versus the prior year, led by the U.S., Asia Pacific and Latin America, including benefits from expanded distribution through the Comex concessionaire network.

Aerospace coatings sales volumes increased modestly versus the prior year despite lower commercial demand stemming from continuing customer inventory management. Regionally, Asian and European sales growth was largely offset by declines in the U.S. and Canada.

Automotive refinish coatings organic sales grew at a mid-single-digit percentage rate year-over-year, outperforming end-use market demand levels in the U.S. and Canada and Asia Pacific.

Segment income increased \$34 million (+5%) year-over-year despite the impact of approximately \$15 million of planned incremental costs for new product launches and other growth-related initiatives in major U.S. architectural coatings national accounts. The increase in segment income was primarily due to acquisition-related income and continued strong cost management, including additional business restructuring benefits. Unfavorable foreign currency translation reduced segment income by nearly \$20 million.

Industrial Coatings

	Six Months		\$	%
	Ended		Change	Change
	June 30			
(\$ in millions, except per share amounts)	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	2,816	2,751	\$ 65	2.4 %
Segment income	557	504	\$ 53	10.5 %

2016 vs. 2015

Industrial Coatings segment net sales increased (+2%) due to the following:

Net sales attributable to acquired businesses (+4%)

Higher sales volumes (+2%), led by growth in Europe.

Partially offset by:

Unfavorable foreign currency translation of approximately \$80 million (-3%)

Lower selling prices (-1%)

PPG's global automotive OEM coatings business sales volumes were consistent with the prior year, reflecting modest global automotive industry production growth. PPG's sales volumes differed by region, with year-over-year growth tempered in Asia-Pacific given the prior year double-digit percentage growth.

Global industrial coatings and specialty coatings and materials sales volumes, in aggregate, increased a low-to-mid-single-digit percentage year-over-year, as growth momentum continued. Sales volumes remained uneven by end-use market and geography. Regionally, European sales volumes continued to expand, Asia sales volumes increased, while the U.S. and Canada experienced negative growth rates. Sales volumes in Latin America were flat. Global packaging coatings sales volumes were up a mid-to-high single-digit percentage year-over-year, with at least mid-single digit percentage growth in all regions, driven primarily by continued strong sales growth momentum for new can coatings technologies.

Segment income increased \$53 million (+10.5%) primarily due to lower manufacturing costs, including business restructuring benefits, higher sales volumes and acquisition-related income, partially offset by unfavorable foreign currency translation (\$11 million).

Glass

	Six Months Ended June 30	\$	% Change	% Change
(\$ in millions, except per share amounts)	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	543	546	\$ (3)	(0.5)%
Segment income 2016 vs. 2015	71	67	\$ 4	6.0 %

Glass segment net sales decreased (-0.5%) due to the following:

Lower sales volumes (-1%)

Lower sales stemming from a prior year flat glass production facility divestiture (-1%)

Unfavorable foreign currency translation (-1%)

Partially offset by:

Higher selling prices (+2%)

Flat glass sales volumes decreased by a low-single digit percentage reflecting the impact of a scheduled facility outage at the company's Fresno, California facility during the six-months ended. Sales were also lower year-over-year due to the prior year sale of remaining finished goods from a previously divested flat glass manufacturing facility. Despite the lower sales volumes, underlying flat glass end-use market demand remained solid. Selling prices improved year-over-year.

Fiber glass sales volumes declined modestly year-over-year, as higher demand for automotive and wind energy components in Europe was offset by lower demand in certain U.S. energy-related end-use markets. Selling prices were flat year over year.

Segment income increased \$4 million (6%) due to lower sales volumes, \$12 million of repair-related costs for the scheduled Fresno facility outage and lower equity earnings, driven by weaker consumer electronics demand in Asia, partially offset by disciplined cost management.

Liquidity and Capital Resources

PPG had cash and short-term investments totaling approximately \$1.7 billion and \$1.5 billion at June 30, 2016 and December 31, 2015, respectively.

Cash used for operating activities - continuing operations for the six months ended June 30, 2016 was \$25 million.

Cash from operating activities - continuing operations was \$186 million for the six months ended June 30, 2015.

Operating cash flow compared with prior year decreased primarily due to funding of the asbestos settlement trust (\$813 million) and higher cash tax payments (\$27 million) partially offset by lower working capital (\$376 million) and lower pension contributions (\$270 million).

Other uses of cash during the six months ended June 30, 2016 included:

• Capital expenditures, excluding acquisitions, of \$168 million, or about 2% of sales.

• Mandatory contributions to PPG's non-U.S. pension plans of \$13 million.

• Cash dividends paid totaled \$203 million.

• Cash spent on share repurchases totaled \$150 million.

In May 2016, PPG entered into two \$250 million Term Loan Credit Agreements. One term loan agreement is with the Bank of Tokyo-Mitsubishi UFJ, Ltd. (the "BTM Term Loan") under which the Company has borrowed \$250 million. The second term loan credit agreement is with BNP Paribas (the "BNP Term Loan") under which the Company has borrowed \$250 million. The BTM Term Loan terminates and all amounts outstanding are payable on March 30, 2017. The BNP Term Loan terminates and all amounts outstanding are payable on May 26, 2017.

In January 2016, PPG's \$250 million 1.9% notes matured, and PPG repaid these notes with cash on hand.

In 2016, PPG changed the method it uses to estimate the service and interest cost components of net periodic benefit cost for pension and other postretirement benefit costs for substantially all of its U.S. and foreign plans. Historically, the service and interest cost components were estimated using a single weighted-average discount rate derived from

the yield curve used to measure the projected benefit obligation at the beginning of the period. PPG has elected to use a full yield curve approach (“Split-rate”) to estimate these components of benefit cost by applying specific spot rates along the yield curve used to determine the benefit obligation to the relevant projected cash flows. PPG made

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this change to improve the correlation between projected benefit cash flows and the corresponding yield curve spot rates and to provide a more precise measurement of service and interest costs. This change does not affect the measurement of the Company's total benefit obligations. PPG accounted for this change as a change in estimate and, accordingly, is recognizing its effect prospectively beginning in fiscal year 2016.

On April 16, 2015, the PPG Board of Directors approved a 2-for-1 split of the Company's common stock for all shareholders. The record date for the split was the close of business on May 11, 2015 and the additional shares were distributed on June 12, 2015. Each shareholder as of the date of record received one additional share of common stock for each share held. Historical per share and share data in this Form 10-Q give retroactive effect to the stock split. These adjustments had no impact on our previously reported net income, total assets, cash flows or shareholders' equity.

Total capital spending in 2016 is expected to be in the range of 3.0% to 3.5% of full year sales. Also, PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of \$20 million to \$25 million in the remainder of 2016.

We believe that our cash on hand and short term investments, cash from operations and the Company's available borrowing capacity will continue to be sufficient to fund operating activities, capital spending, including acquisitions, dividend payments, debt service, share repurchases and contributions to pension plans. We intend to deploy our cash in a timely, disciplined manner with a continued emphasis on incremental earnings accretive initiatives, including additional acquisitions and share repurchases. The Company expects to deploy cash for business acquisitions and share repurchases of between \$2 billion and \$2.5 billion for years 2015 and 2016 combined. To date, we have deployed cash of approximately \$1.6 billion, including the MetoKote acquisition which closed on July 1, 2016. PPG's total debt to equity ratio (total debt, including capital leases, to total debt and PPG shareholders' equity) was 49% at June 30, 2016 and 46% at December 31, 2015.

Operating Working Capital is a subset of total working capital and represents (1) trade receivables – net of the allowance for doubtful accounts, (2) inventories and (3) trade liabilities. We believe Operating Working Capital represents the key components of working capital under the operating control of our businesses. A key metric we use to measure improvement in our working capital management is Operating Working Capital as a percentage of sales (current quarter sales annualized).

(\$ in millions, except percentages)	June 30, 2016 (a)	December 31, 2015	June 30, 2015
Trade Receivables, Net	\$2,779	\$2,413	\$2,912
Inventories, FIFO	1,943	1,868	2,036
Trade Creditors' Liabilities	2,118	1,940	2,036
Operating Working Capital	\$2,604	\$2,341	\$2,912
Operating Working Capital as a % of Sales	16.0 %	15.8 %	17.8 %

(a) Reclassifications for Assets and Liabilities held for sale related to the European fiber glass business reduced Operating Working Capital by \$14 million as of June 30, 2016. Excluding the impact of the reclassifications on the balance sheet, operating working capital was \$2,618 million, or 16.1% of sales.

Days sales outstanding at June 30, 2016 was 56 days, as reported, up from 54 days as of December 31, 2015. Day sales outstanding as of June 30, 2015 was 58 days.

Other Liquidity Information

(\$ in millions)	Three Months Ended June 30 2016	Six Months Ended June 30 2015
Cash outlays for environmental remediation activities	\$9 \$20	\$23 \$56
(\$ in millions)	Remainder Annually	

of 2016 2017 - 2019

Projected future cash outlays for environmental remediation activities \$10 - \$25 \$25 - \$45

On July 20, 2016, PPG signed a definitive agreement to sell the assets of its flat glass manufacturing and glass coatings operations to Vitro S.A.B. de C.V., a leading producer of flat glass and specialty products. The transaction is expected to close by the end of 2016, subject to customary closing conditions. PPG will receive approximately \$750 million in

gross cash proceeds. PPG will report the assets and liabilities of the flat glass business as "Assets held for sale" and "Liabilities held for sale" on the condensed consolidated balance sheet and the results of operations of the flat glass business as discontinued operations on the condensed consolidated statements of income and cash flows beginning in the third quarter 2016.

On June 20, 2016, PPG announced that it has signed an agreement for the sale of its European fiber glass operations to glass manufacturer Nippon Electric Glass Co. Ltd. ("NEG"). The transaction is subject to completion of employee consultation processes, receipt of regulatory clearances and other customary closing conditions. PPG and NEG expect to close the transaction in the second half of 2016.

On June 9, 2016, PPG fully funded its portion of the Pittsburgh Corning asbestos settlement trust ("Trust") that was established by the U.S. Bankruptcy Court for the Western District of Pennsylvania in May 2016. The obligations included cash funding of \$506 million (pre-tax) and the transfer of about 2.78 million shares of PPG common stock, which were hedged at approximately \$22 per share. These shares were already included in the company's outstanding diluted share count. Lastly, PPG relinquished any claim to its equity interest in Pittsburgh Corning and conveyed to the Trust its ownership interest in Pittsburgh Corning's European subsidiary. In addition to the initial funding obligation, the company exercised an option to prepay all future cash obligations, totaling a net of \$258 million (pre-tax), including a 5.5 percent prepayment discount of \$61 million. All payments were applied against a previously established PPG reserve for the total asbestos-trust obligation. The company utilized cash on hand for the payments, and this funding will have no impact on PPG's previously stated cash-deployment targets. Refer to Note 15, "Commitments and Contingent Liabilities" under Item 1 of this Form 10-Q for additional information. The funding of the Trust is expected to lower PPG's 2016 full year current tax liability by approximately \$300 million, contemplating the 2016 sale of the flat glass business and absent other future changes to taxable income.

In conjunction with the 2013 separation of its commodity chemicals business, PPG conveyed to Axiall Corporation ("Axiall") its 60% ownership interest in Taiwan Chlorine Industries ("TCI"), a joint venture with China Petrochemical Development Corporation ("CPDC") located in Taiwan. Under PPG's agreement with CPDC, if certain post-closing conditions were not met following the 3 year anniversary of the separation, CPDC had the option to sell its 40% ownership interest in TCI to Axiall for \$100 million. In turn, Axiall had a right to designate PPG as its designee to purchase the 40% ownership interest of CPDC. On April 22, 2016, Axiall announced that CPDC had decided to sell its ownership interest in TCI to Axiall. On June 19, 2016, Axiall formally designated PPG to purchase the 40% ownership interest in TCI. PPG is evaluating its options regarding CPDC's exercise of the put and Axiall's subsequent designation of PPG to purchase the 40% ownership interest.

Pension Annuity Contracts

On June 24, 2016, the Company entered into (a) a Definitive Purchase Agreement by and among the Company, Massachusetts Mutual Life Insurance Company ("MassMutual") and State Street Bank & Trust Company ("State Street"), as independent fiduciary to the Company's United States defined benefit pension plans (the "Plans"), and (b) a Definitive Purchase Agreement by and among the Company, Metropolitan Life Insurance Company ("MetLife") and State Street, pursuant to which the Plans will purchase group annuity contracts that will irrevocably transfer to the two insurance companies the future pension benefit obligations for approximately 13,200 of the Company's retirees in the United States who started receiving their monthly retirement benefit payments on or before April 1, 2016.

Upon issuance of the group annuity contracts, the value of the benefit obligation of each affected former salaried employee's retirement benefit obligation will be irrevocably guaranteed by, and split equally between, MassMutual and MetLife. Pursuant to these Definitive Purchase Agreements, MassMutual will serve as the lead administrator and, beginning September 1, 2016, it will make each former salaried employee's full annuity payment on behalf of itself and MetLife. The value of the benefit obligation of each affected former hourly employee's retirement benefit obligation will be irrevocably guaranteed by MetLife, and MetLife will serve as the administrator. Beginning September 1, 2016, MetLife will make each former hourly employee's full annuity payment.

The amount of each affected retiree's annuity payment will be equal to the amount of such individual's pension benefit. By irrevocably transferring the obligations to MassMutual and MetLife, the Company will reduce its overall pension

projected benefit obligation by approximately \$1.6 billion. The purchase of group annuity contracts will be funded directly by the assets of the Plans.

The Definitive Purchase Agreements each contain closing conditions customary for a transaction of this nature, including certain termination clauses. Assuming all closing conditions are satisfied, the Company expects the purchase of the irrevocable group annuity contracts would occur in the third quarter of 2016.

The Company expects to make an aggregate contribution of approximately \$175 million to the Plans in 2016 and 2017. These contributions will be funded by cash on hand. The Company expects to recognize a non-cash pension settlement charge of approximately \$500 to \$600 million after-tax (approximately \$800 million to \$1.0 billion pre-tax) in the third quarter of 2016 resulting from the purchase of the group annuity contracts.

Currency

Comparing exchange rates from December 31, 2015 to June 30, 2016, the U.S. dollar weakened against most of the currencies in the countries in which PPG operates, most notably the Euro. As a result, consolidated net assets at June 30, 2016 increased by \$82 million, compared to December 31, 2015. Comparing exchange rates during the first six months of 2016 to those of the first six months of 2015, the U.S. dollar strengthened against the currencies of most countries in which PPG operates, most notably the Mexican Peso. This had an unfavorable impact on pre-tax income from continuing operations for the six months ended June 30, 2016 of \$29 million from the translation of these foreign earnings into U.S. dollars.

New Accounting Standards

See Note 2, "New Accounting Standards," to the accompanying condensed consolidated financial statements for further details on recently issued accounting guidance.

Commitments and Contingent Liabilities, including Environmental Matters

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. See Part II, Item 1, "Legal Proceedings" of this Form 10-Q and Note 15, "Commitments and Contingent Liabilities," to the accompanying condensed consolidated financial statements for a description of certain of these lawsuits, including a description of the proposed asbestos settlement. As discussed in Part II, Item 1 and Note 15, although the result of any future litigation of such lawsuits and claims is inherently unpredictable, management believes that, in the aggregate, the outcome of all lawsuits and claims involving PPG, including asbestos-related claims, will not have a material effect on PPG's consolidated 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.

As also discussed in Note 15, PPG has significant reserves for environmental contingencies. Please refer to the Environmental Matters section of Note 15 for details of these reserves. A significant portion of our reserves for environmental contingencies relate to ongoing remediation at PPG's former chromium manufacturing plant in Jersey City, N.J. and associated sites ("New Jersey Chrome"). The Company continues to analyze, assess and remediate the environmental issues associated with New Jersey Chrome. Information will continue to be generated from the ongoing groundwater remedial investigation activities related to New Jersey Chrome and will be incorporated into a final draft remedial action work plan for groundwater expected to be submitted to the New Jersey Department of Environmental Protection in 2020.

It is possible that technological, regulatory and enforcement developments, the results of environmental studies and other factors could alter the Company's expectations with respect to future charges against income and future cash outlays. Specifically, the level of expected future remediation costs and cash outlays is highly dependent upon activity related to New Jersey Chrome.

Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a safe harbor for forward-looking statements made by or on behalf of the Company. Management's Discussion and Analysis and other sections of this Annual Report contain forward-looking statements that reflect the Company's current views with respect to future events and financial performance. You can identify forward-looking statements by the fact that they do not relate strictly to current or historic facts. Forward-looking statements are identified by the use of the words "aim," "believe," "expect," "anticipate," "intend," "estimate," "project," "outlook," "forecast" and other expressions that indicate future events and trends. Any forward-looking statement speaks only as of the date on which such statement is made, and the Company undertakes no obligation to update any forward looking statement, whether as a result of new information, future events or otherwise. You are advised, however, to consult any further disclosures we make on related subjects in our reports to the Securities and Exchange Commission. Also, note the following cautionary statements.

Many factors could cause actual results to differ materially from the Company's forward-looking statements. Such factors include global economic conditions, increasing price and product competition by foreign and domestic competitors, fluctuations in cost and availability of raw materials, the ability to maintain favorable supplier relationships and arrangements, the timing of and the realization of anticipated cost savings from restructuring initiatives, difficulties

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in integrating acquired businesses and achieving expected synergies therefrom, economic and political conditions in international markets, the ability to penetrate existing, developing and emerging foreign and domestic markets, foreign exchange rates and fluctuations in such rates, fluctuations in tax rates, the impact of future legislation, the impact of environmental regulations, unexpected business disruptions and the unpredictability of existing and possible future litigation. However, it is not possible to predict or identify all such factors.

Consequently, while the list of factors presented here and in the Company's Form 10-K for the year ended December 31, 2015 under the caption "Item 1A Risk Factors" are considered representative, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles to the realization of forward-looking statements.

Consequences of material differences in the results compared with those anticipated in the forward-looking statements could include, among other things, lower sales or earnings, business disruption, operational problems, financial loss, legal liability to third parties, other factors set forth in "Item 1A. Risk Factors" of the Company's Form 10-K for the year ended December 31, 2015 and similar risks, any of which could have a material adverse effect on the Company's consolidated financial condition, results of operations or liquidity.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

As of June 30, 2016, PPG had non-U.S. dollar denominated borrowings outstanding of \$2.3 billion. As of December 31, 2015, PPG had non-U.S. dollar denominated borrowings outstanding of \$2.1 billion. A weakening of the U.S. dollar by 10% against European currencies and by 20% against Asian and South American currencies would have resulted in unrealized translation losses on these borrowings of approximately \$285 million and \$242 million as of June 30, 2016 and December 31, 2015, respectively.

There were no other material changes in the Company's exposure to market risk from December 31, 2015 to June 30, 2016. See Note 13, "Financial Instruments, Hedging Activities and Fair Value Measurements" for a description of our instruments subject to market risk.

Item 4. Controls and Procedures

a. Evaluation of disclosure controls and procedures. Based on their evaluation as of the end of the period covered by this Form 10-Q, the Company's principal executive officer and principal financial officer have concluded that the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934 (the "Exchange Act")) are effective to ensure that information required to be disclosed by the Company in reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms and to ensure that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the Company's management, including its principal executive and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure.

b. Changes in internal control. There were no changes in the Company's internal control over financial reporting that occurred during the Company's most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. These lawsuits and claims may relate to contract, patent, environmental, product liability, antitrust and other matters arising out of the conduct of PPG's current and past business activities. To the extent that these lawsuits and claims involve personal injury and property damage, PPG believes it has adequate insurance; however, certain of PPG's insurers are contesting coverage with respect to some of these claims, and other insurers, as they had prior to the asbestos settlement described below, may contest coverage in the future. PPG's lawsuits and claims against others include claims against insurers and other third parties with respect to actual and contingent losses related to environmental, asbestos and other matters.

The results of any future litigation and claims are inherently unpredictable. However, management believes that, in the aggregate, the outcome of all lawsuits and claims involving PPG, including asbestos-related claims, 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.

For many years, PPG has been a defendant in lawsuits involving claims alleging personal injury from exposure to asbestos. For a description of asbestos litigation affecting the Company and the terms and status of the asbestos settlement arrangement, see Note 15, "Commitments and Contingent Liabilities" to the accompanying condensed consolidated financial statements under Part I, Item 1 of this Form 10-Q.

In the past, the Company and others have been named as defendants in several cases in various jurisdictions claiming damages related to exposure to lead and remediation of lead-based coatings applications. PPG has been dismissed as a defendant from most of these lawsuits and has never been found liable in any of these cases.

In March 2016, the Natural Resource Trustees for the Calcasieu River Estuary (Louisiana Department of Environmental Quality, The United States Environmental Protection Agency and the United States Department of the Interior) reached an agreement in principle with PPG and two other potentially responsible parties to resolve the Trustees' claims for natural resource damages alleged to have been caused by the release of hazardous substances into the Estuary. PPG's share of this settlement is \$3,600,000.

In July 2013, the EPA issued to PPG a Notice of Violation ("NOV") alleging that the Company's Barberton, Ohio facility violated certain air emission regulatory requirements of the federal Clean Air Act. In February 2015, the EPA issued a second NOV to the Company alleging that the Company's Barberton facility had failed to submit certain information requested by the EPA and that the facility exceeded certain air emission limits contained in the facility's air emission permit. In June 2016, PPG and the EPA entered into a Consent Agreement and Final Order for the resolution of this matter which included a stipulated civil penalty of \$137,500.

In December 2011, the United States Environmental Protection Agency ("EPA") issued a Finding of Violation alleging that PPG's Delaware, Ohio facility violated certain leak detection and repair ("LDAR") requirements of the federal Clean Air Act. PPG and the EPA have reached an agreement in principle to settle this matter with a total civil penalty of \$225,000 and certain enhancements to the facility's LDAR program. PPG and the EPA are in the process of finalizing the terms of a Consent Decree for this matter which will memorialize the terms of this settlement.

Item 1A. Risk Factors

There were no material changes in the Company's risk factors from the risks disclosed in the Company's Form 10-K for the year ended December 31, 2015.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Directors who are not also officers of the Company receive common stock equivalents pursuant to the PPG Industries, Inc. Deferred Compensation Plan for Directors ("PPG Deferred Compensation Plan for Directors"). Common stock equivalents are hypothetical shares of common stock having a value on any given date equal to the value of a share of common stock. Common stock equivalents earn dividend equivalents that are converted into additional common stock equivalents but carry no voting rights or other rights afforded to a holder of common stock. The common stock equivalents credited to directors under both plans are exempt from registration under Section 4(a)(2) of the Securities Act of 1933 as private offerings made only to directors of the Company in accordance with the provisions of the plans.

Under the PPG Deferred Compensation Plan for Directors, each director may elect to defer the receipt of all or any portion of the compensation paid to such director for serving as a PPG director. All deferred payments are held in the form of common stock equivalents. Payments out of the deferred accounts are made in the form of common stock of the Company (and cash as to any fractional common stock equivalent). In the second quarter of 2016, the directors,

as a group, were credited with 7,553 common stock equivalents under this plan. The value of each common stock equivalent, when credited, ranged from \$109.24 to \$116.07.

Issuer Purchases of Equity Securities

No shares were repurchased in the quarter ended June 30, 2016 under the current \$2 billion share repurchase program approved in April 2014. The maximum number of shares that may yet be purchased under this program is 7,392,432 shares. This repurchase program has no expiration date.

Item 6. Exhibits

See the Index to Exhibits on Page 49.

SIGNATURES

Pursuant to the requirements 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.

PPG INDUSTRIES, INC.
(Registrant)

Date: July 22, 2016 By: /s/ Frank S. Sklarsky
Frank S. Sklarsky
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer and Duly Authorized Officer)

PPG INDUSTRIES, INC. AND SUBSIDIARIES

Index to Exhibits

The following exhibits are filed as part of, or incorporated by reference into, this Form 10-Q.

- †2.1 Definitive Purchase Agreement, dated as of June 24, 2016, by and among Massachusetts Mutual Life Insurance Company, PPG Industries, Inc. and State Street Bank and Trust Company, as Independent Fiduciary of the PPG Industries, Inc. Pension Plans.
- †2.2 Definitive Purchase Agreement, dated as of June 24, 2016, by and among Metropolitan Life Insurance Company, PPG Industries, Inc. and State Street Bank and Trust Company, as Independent Fiduciary of the PPG Industries, Inc. Pension Plans.
- 10.3 Term Loan Credit Agreement, dated May 27, 2016, between PPG Industries, Inc. and The Bank of Tokyo-Mitsubishi UFJ, Ltd. was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on June 3, 2016.
- 10.4 Term Loan Agreement, dated May 27, 2016, among PPG Industries, Inc., BNP Paribas, as administrative agent for the lenders, and BNP Paribas Securities Corp., as sole lead arranger, was filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed on June 3, 2016.
- ††12 Computation of Ratio of Earnings to Fixed Charges for the Six Months Ended June 30, 2016 and for the Five Years Ended December 31, 2015.
- ††31.1 Certification of Principal Executive Officer Pursuant to Rule 13a-14(a) or 15d-14(a) of the Exchange Act, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- ††31.2 Certification of Principal Financial Officer Pursuant to Rule 13a-14(a) or 15d-14(a) of the Exchange Act, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- †††32.1 Certification of Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- †††32.2 Certification of Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- 101.INS* XBRL Instance Document
- 101.SCH* XBRL Taxonomy Extension Schema Document
- 101.CAL* XBRL Taxonomy Extension Calculation Linkbase Document
- 101.DEF* XBRL Taxonomy Extension Definition Linkbase Document
- 101.LAB* XBRL Taxonomy Extension Label Linkbase Document
- 101.PRE* XBRL Taxonomy Extension Presentation Linkbase Document

† Filed herewith. Confidential treatment has been requested for portions of this agreement. Schedules and exhibits to this agreement have been omitted pursuant to Item 601(b)(2) of Regulation S-K. A copy of any omitted schedule or exhibit will be furnished supplementally to the Securities and Exchange Commission on request.

†† Filed herewith.

††† Furnished herewith.

* Attached as Exhibit 101 to this report are the following documents formatted in XBRL (Extensible Business Reporting Language): (i) the Condensed Consolidated Statement of Income for the three and six months ended June 30, 2016 and 2015, (ii) the Condensed Consolidated Balance Sheet at June 30, 2016 and December 31, 2015, (iii) the Condensed Consolidated Statement of Cash Flows for the six months ended June 30, 2016 and 2015, and (iv) Notes to Condensed Consolidated Financial Statements for the three and six months ended June 30, 2016.