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 September 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 September 30, 2016 , 263,995,244 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 September 30		Nine Months Ended September 30	
	2016	2015	2016	2015
Net sales	$ 3,789	$ 3,725	$ 11,254	$ 11,214
Cost of sales, exclusive of depreciation and amortization	2,081	2,049	6,095	6,209
Selling, general and administrative	899	875	2,746	2,715
Depreciation	88	87	258	253
Amortization	31	33	91	99
Research and development, net	117	117	350	354
Interest expense	34	31	96	94
Interest income	(6)	(10)	(20)	(31)
Pension settlement charges	968	—	968	—
Business restructuring	—	—	—	140
Asbestos settlement, net	—	3	5	9
Other charges	13	21	66	71
Other income	(23)	(35)	(88)	(92)
(Loss) income from continuing operations before income taxes	(413)	554	687	1,393
Income tax (benefit) expense	(217)	133	182	333
(Loss) income from continuing operations	(196)	421	505	1,060
Income from discontinued operations, net of tax	17	18	46	49
Net (loss) income attributable to the controlling and noncontrolling interests	(179)	439	551	1,109
Less: Net income attributable to noncontrolling interests	(5)	(6)	(18)	(17)
Net (loss) income (attributable to PPG)	$ (184)	$ 433	$ 533	$ 1,092
Amounts attributable to PPG:				
(Loss) income from continuing operations, net of tax	$ (201)	$ 415	$ 487	$ 1,043
Income from discontinued operations, net of tax	17	18	46	49
Net (loss) income (attributable to PPG)	$ (184)	$ 433	$ 533	$ 1,092
(Loss) Earnings per common share:				
(Loss) income from continuing operations, net of tax	$ (0.75)	$ 1.53	$ 1.83	$ 3.83
Income from discontinued operations, net of tax	0.06	0.07	0.17	0.18
Net (loss) income (attributable to PPG)	$ (0.69)	$ 1.60	$ 2.00	$ 4.01
(Loss) Earnings per common share – assuming dilution:				
(Loss) income from continuing operations, net of tax	$ (0.75)	$ 1.52	$ 1.81	$ 3.80
Income from discontinued operations, net of tax	0.06	0.07	0.17	0.18
Net (loss) income (attributable to PPG)	$ (0.69)	$ 1.59	$ 1.98	$ 3.98
Dividends per common share	$ 0.40	$ 0.36	$ 1.16	$ 1.05

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 September 30		Nine Months Ended September 30	
	2016	2015	2016	2015
Net (loss) income attributable to the controlling and noncontrolling interests	$ (179)	$ 439	$ 551	$ 1,109
Other comprehensive income (loss), net of tax:				
Defined benefit pension and other postretirement benefits, net	348	35	391	109
Unrealized foreign currency translation adjustments	(147)	(300)	(231)	(599)
Derivative financial instruments, net	8	2	—	6
Other comprehensive income (loss), net of tax	209	(263)	160	(484)
Total comprehensive income	$ 30	$ 176	$ 711	$ 625
Less: amounts attributable to noncontrolling interests:				
Net income	(5)	(6)	(18)	(17)
Unrealized foreign currency translation adjustments	(1)	3	1	8
Comprehensive income attributable to PPG	$ 24	$ 173	$ 694	$ 616

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)

	September 30, 2016	December 31, 2015
Assets		
Current assets:		
Cash and cash equivalents	$ 929	$ 1,311
Short-term investments	46	144
Receivables (less allowance for doubtful accounts of $46 in each period)	2,962	2,709
Inventories	1,676	1,659
Assets held for sale	443	285
Other	361	604
Total current assets	6,417	6,712
Property, plant and equipment (net of accumulated depreciation of $3,921 and $3,927)	2,863	2,822
Goodwill	3,701	3,669
Identifiable intangible assets, net	2,073	2,178
Deferred income taxes	516	711
Investments	328	367
Other assets	592	617
Total	$ 16,490	$ 17,076
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable and accrued liabilities	$ 3,567	$ 3,419
Asbestos settlement	—	796
Restructuring reserves	42	87
Short-term debt and current portion of long-term debt	652	281
Liabilities held for sale	199	112
Total current liabilities	4,460	4,695
Long-term debt	3,752	4,026
Accrued pensions	1,001	695
Other postretirement benefits	811	1,015
Asbestos settlement	—	252
Deferred income taxes	521	460
Other liabilities	824	864
Total liabilities	11,369	12,007
Commitments and contingent liabilities (Note 15)		
Shareholders' equity:		
Common stock	969	969
Additional paid-in capital	683	635
Retained earnings	15,744	15,521
Treasury stock, at cost	(9,824)	(9,440)
Accumulated other comprehensive loss	(2,541)	(2,702)
Total PPG shareholders' equity	5,031	4,983
Noncontrolling interests	90	86
Total shareholders' equity	5,121	5,069
Total	$ 16,490	$ 17,076

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

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PPG INDUSTRIES, INC. AND SUBSIDIARIES

Condensed Consolidated Statement of Cash Flows (Unaudited)

($ in millions)

	Nine Months Ended September 30	
	2016	2015
Operating activities:		
Net income attributable to controlling and noncontrolling interests	$ 551	$ 1,109
Less: Income from discontinued operations	(46)	(49)
Income from continuing operations	505	1,060
Adjustments to reconcile net income to cash from operations:		
Depreciation and amortization	349	352
Pension expense	60	74
Pension Settlement	968	—
Stock-based compensation expense	38	42
Business restructuring	—	140
Gain on sale of equity affiliate	(20)	—
Equity affiliate earnings, net of distributions received	(8)	(20)
Deferred income tax benefit	(56)	(42)
Cash contributions to pension plans	(78)	(270)
Cash paid for restructuring actions	(40)	(31)
Cash paid for asbestos settlement funding	(813)	—
Change in certain asset and liability accounts:		
Receivables	(250)	(413)
Inventories	(31)	(89)
Other current assets	(11)	(97)
Accounts payable and accrued liabilities	135	184
Taxes and interest payable	(127)	127
Noncurrent assets and liabilities, net	46	(67)
Other	—	(17)
Cash from operating activities - continuing operations	667	933
Cash from operating activities - discontinued operations	84	53
Cash from operating activities	751	986
Investing activities:		
Capital expenditures	(258)	(262)
Business acquisitions, net of cash balances acquired	(321)	(248)
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	171
Payments for the settlement of cross currency swap contracts	(36)	(34)
Proceeds from cross currency swap and foreign currency contracts	37	37
Other	14	39
Cash used for investing activities - continuing operations	(431)	(347)
Cash used for investing activities - discontinued operations	(14)	(4)
Cash used for investing activities	(445)	(351)
Financing activities:		
Net change in borrowing with maturities of three months or less	(22)	(18)
Net proceeds (payments) on commercial paper and short-term debt	297	(392)
Proceeds from the issuance of debt	1	1,242
Repayment of long-term debt	(254)	(339)
Purchase of treasury stock	(400)	(501)
Issuance of treasury stock	29	51
Dividends paid	(309)	(287)

Other	(9)	(24)
Cash used for financing activities - continuing operations	(667)	(268)
Cash used for financing activities - discontinued operations	—	—
Cash used for financing activities	(667)	(268)
Effect of currency exchange rate changes on cash and cash equivalents	(21)	(38)
Net (decrease) increase in cash and cash equivalents	(382)	329
Cash and cash equivalents, beginning of period	1,311	686
Cash and cash equivalents, end of period	$ 929	$ 1,015
Supplemental disclosures of cash flow information:		
Interest paid, net of amount capitalized	$ 80	$ 78
Taxes paid, net of refunds	$ 276	$ 291

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 September 30, 2016 , and the results of their operations for the three and nine months ended September 30, 2016 and 2015 and their cash flows for the nine 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 nine months ended September 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.

On October 1, 2016, PPG completed the sale of its flat glass manufacturing and glass coatings operations to Vitro S.A.B. de C.V. The accompanying condensed consolidated statements of income and cash flows for the three and nine months ended September 30, 2015 and the amounts in these notes to the condensed consolidated financial statements have been recast to reflect the presentation of the results of operations and cash flows of the former flat glass business as discontinued operations. In addition, the assets and liabilities of the flat glass business are presented as "Assets held for sale" and "Liabilities held for sale" on the condensed consolidated balance sheet for all periods presented. Refer to Note 3, "Acquisitions and Dispositions", for additional information regarding this transaction.

2 . New Accounting Standards

In August 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-15, "Classification of Certain Cash Receipts and Cash Payments." This ASU addresses eight specific cash flow issues with the objective of eliminating the existing diversity in practice. The amendments in this ASU are effective for public business entities for fiscal years beginning after December 15, 2017, and for interim periods therein. PPG does not believe this ASU will have a material impact on its consolidated financial position, results of operation and cash flows.

In June 2016, the FASB issued 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 does not believe this ASU will have a material impact on its consolidated financial position, results of operation 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 does not believe this ASU will have a material impact on its consolidated financial position, results of operation 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.

PPG is in the process of obtaining third-party valuations of assets acquired and liabilities assumed in the MetoKote acquisition. As such, the allocation of the purchase price is subject to change. The following table summarizes the estimated fair value of assets acquired and liabilities assumed as reflected in the purchase price allocation for MetoKote.

($ in millions)	September 30, 2016
Receivables	$ 30
Inventory	4
Property, plant, and equipment	96
Identifiable intangible assets	83
Goodwill	129
Total Assets	$ 342
Accounts payable and accrued liabilities	10
Other current liabilities	10
Other long-term liabilities	16
Total Liabilities	$ 36
Total purchase price, net of cash acquired	$ 306

The pro-forma impact on PPG's sales and results of operations, including the pro forma effect of events that are directly attributable to the acquisition, was not significant. While calculating this impact, no cost savings or operating synergies that may result from the acquisition were included.

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. On August 31, 2016, Westlake Chemical Corporation acquired Axiall, which became a wholly-owned subsidiary of Westlake. PPG is currently negotiating the terms of its purchase of CPDC’s 40% ownership interest.

Dispositions

Flat Glass Business

On October 1, 2016, PPG completed the sale of its flat glass manufacturing and glass coatings operations to Vitro S.A.B. de C.V. PPG received approximately $740 million in cash proceeds and expects to record a gain on the sale during the fourth quarter 2016. PPG reported the assets and liabilities of the flat glass business as "Assets held for sale" and "Liabilities held for sale" in the accompanying condensed consolidated balance sheets and the results of operations of the flat glass business as discontinued operations on the condensed consolidated statements of income and cash flows for all periods presented.

Under the terms of the agreement, PPG divested 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 included approximately 1,200 employees. The business manufactures glass that is fabricated into products used primarily in commercial and residential construction.

The net sales and income from discontinued operations related to the flat glass business for the three and nine months ended September 30, 2016 and 2015 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2016	2015	2016	2015
Net sales	$ 156	$ 147	$ 427	$ 421
Income from operations	26	27	70	70
Income tax expense	9	9	24	23
Income from discontinued operations, net of tax	$ 17	$ 18	$ 46	$ 47

The major classes of assets and liabilities of the flat glass business included in the PPG condensed consolidated balance sheet at September 30, 2016 and December 31, 2015 were as follows:

($ in millions)	September 30, 2016	December 31, 2015
Receivables	$ 83	$ 79
Inventory	66	47
Property, plant, and equipment	190	196
Deferred income taxes (a)	(37)	(37)
Assets held for sale	$ 302	$ 285
Short-term debt and current portion of long-term debt	1	1
Accounts payable and accrued liabilities	67	72
Long-term debt	15	16
Accrued pensions	21	16
Other postretirement benefits	4	6
Other long-term liabilities	3	1
Liabilities held for sale	$ 111	$ 112

(a) The net deferred income tax liability is included in assets held for sale due to the Company's tax jurisdictional netting.

European Fiber Glass Business

On October 1, 2016, PPG completed the sale of its European fiber glass operations to glass manufacturer Nippon Electric Glass Co. Ltd. ("NEG") and received cash proceeds of approximately $120 million . Manufacturing facilities in Hoogezand, Netherlands, and Wigan, England, and a research-and-development facility in Hoogezand were included in the transaction. The European fiber glass operations manufacture reinforcement materials for thermoset and thermoplastic composite applications. They serve the transportation, energy, infrastructure and consumer markets. 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 September 30, 2016 in the accompanying condensed consolidated balance sheet. The results of the European fiber

glass business have not been reclassified as discontinued operations, as the divestiture of the European fiber glass business did not have a major impact on PPG's ongoing results of operations.

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

($ in millions)	September 30, 2016
Receivables	$ 24
Inventory	18
Property, plant, and equipment	55
Goodwill	44
Assets held for sale	$ 141
Accounts payable and accrued liabilities	34
Accrued pensions	67
Deferred income taxes (a)	(13)
Other long-term liabilities	—
Liabilities held for sale	$ 88

(a) The net deferred income tax asset is included in liabilities held for sale due to the Company's tax jurisdictional netting.

PFG Fiber Glass Joint Ventures

On September 22, 2016, PPG reached an agreement to divest its 50 percent ownership interests in its two PFG fiber glass joint ventures (PFG) to Nan Ya Plastics Corporation (Nan Ya), which currently controls the other 50 percent ownership interest in the joint ventures. Nan Ya is affiliated with Taiwan-based Formosa Plastics Group. The transaction is expected to close by the end of 2016 and PPG expects to receive cash proceeds of approximately $170 million .

PFG was formed as an equally-held joint venture between PPG and Nan Ya in 1987, with a single production facility in Chia Yi, Taiwan. To meet growing demand, a second joint venture was formed to add a production facility in Kunshan, China in 2001.

PFG supplies electronic yarn fibers used in integrated electronic circuit boards and fiber glass reinforcement products for automotive applications.

Pittsburgh Glass Works LLC

In April 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)	September 30, 2016	December 31, 2015
Finished products	$ 1,063	$ 1,055
Work in process	178	161
Raw materials	398	402
Supplies	37	41
Total Inventories	$ 1,676	$ 1,659

Most U.S. inventories are valued using the last-in, first-out method. These inventories represented approximately 38% and 41% of total inventories at September 30, 2016 and December 31, 2015 , respectively. If the first-in, first-out method of inventory valuation had been used, inventories would have been $135 million and $144 million higher as of September 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 nine months ended September 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	130	—	132
Reclassifications to Assets held for sale	—	—	(44)	(44)
Currency	(67)	11	—	(56)
Balance, September 30, 2016	$ 3,008	$ 693	$ —	$ 3,701

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

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

	September 30, 2016			December 31, 2015		
($ in millions)	Gross Carrying Amount	Accumulated Amortization	Net	Gross Carrying Amount	Accumulated Amortization	Net
Acquired technology	$ 577	$ (444)	$ 133	$ 572	$ (421)	$ 151
Customer-related intangibles	1,334	(641)	693	1,267	(574)	693
Trade names	144	(72)	72	132	(61)	71
Other	41	(29)	12	39	(26)	13
Balance	$ 2,096	$ (1,186)	$ 910	$ 2,010	$ (1,082)	$ 928

Aggregate amortization expense related to these identifiable intangible assets for the three and nine months ended September 30, 2016 was $31 million and $91 million , respectively, and for the three and nine months ended September 30, 2015 was $33 million and $99 million , respectively.

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

($ in millions)	Future Amortization Expense
Remaining three months of 2016	$ 31
2017	135
2018	130
2019	120
2020	105
2021	105
Thereafter	284

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 by the end of 2016.

The 2015 restructuring charge and the reserve activity for 2015 and for the nine months ended September 30, 2016 were 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, net	(45)	—	(45)	(447)
Foreign currency impact	—	—	—	—
Balance as of September 30, 2016	$ 42	$ —	$ 42	359

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 nine months ended September 30, 2016 and 2015 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
(number of shares in millions)	2016	2015	2016	2015
Weighted average common shares outstanding	266.3	271.1	267.0	272.2
Effect of dilutive securities:				
Stock options	—	0.9	0.8	1.0
Other stock compensation awards	—	1.1	1.0	1.2
Potentially dilutive common shares	—	2.0	1.8	2.2
Adjusted weighted average common shares outstanding	266.3	273.1	268.8	274.4

The effect of antidilutive securities on the weighted average common shares outstanding excluded from the calculation of earnings per diluted common share for the three and nine months ended September 30, 2016 and 2015 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
(number of shares in millions)	2016	2015	2016	2015
Effect of anti-dilutive securities:				
Stock options	0.6	0.6	0.6	0.6
Other stock compensation awards	1.8	—	—	—
Potentially anti-dilutive common shares	2.4	0.6	0.6	0.6

9 . Income Taxes

	Nine Months Ended September 30	
	2016	2015
Effective tax rate on pre-tax income from continuing operations	26.5%	23.9%

The effective tax rate for 2016 includes a deferred tax benefit of $352 million related to the $968 million of pre-tax pension settlement charges recorded during the third quarter. 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 used to fund the Trust with 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," "Pension settlement charges" and "Research and development" in the accompanying condensed consolidated statements of income.

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

	Pensions			
	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2016	2015	2016	2015
Service cost	$ 11	$ 14	$ 38	$ 42
Interest cost	21	48	108	150
Expected return on plan assets	(31)	(76)	(169)	(209)
Amortization of actuarial losses	24	34	85	84
Amortization of prior service credit	(1)	(1)	(2)	(2)
Pension settlement charges	968	7	968	7
Curtailments and special termination benefits	—	1	—	2
Net periodic benefit cost	$ 992	$ 27	$ 1,028	$ 74

	Other Postretirement Benefits			
	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2016	2015	2016	2015
Service cost	$ 8	$ 4	$ 14	$ 13
Interest cost	12	11	30	35
Amortization of actuarial losses	10	7	20	23
Amortization of prior service credit	(28)	(2)	(32)	(7)
Net periodic benefit cost	$ 2	$ 20	$ 32	$ 64

PPG expects its net periodic pension and other post-retirement benefit cost, excluding settlement losses, for 2016 will be approximately $120 million , with pension representing approximately $90 million and other post-retirement benefit cost representing approximately $30 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

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2016	2015	2016	2015
U.S. defined benefit pension contributions	$ 50	$ —	$ 50	$ 250
Non-U.S. defined benefit pension voluntary contributions	$ —	$ —	$ —	$ 21
Non-U.S. defined benefit pension mandatory contributions	$ 15	$ —	$ 28	$ 15

PPG expects to make additional contributions to its U.S. defined benefit pension plans of approximately $125 million in the fourth quarter 2016 and the first half of 2017, associated with the annuity transactions discussed below. PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of $5 million to $15 million during the fourth quarter of 2016. As noted below, we expect to make voluntary contributions to our defined benefit pension plans in 2016 and beyond.

Approximately $16 million of the contributions to PPG's U.S. defined benefit pension plans were attributable to the flat glass business and were classified as cash outflows for discontinued operations on the condensed consolidated cash flow statement for the nine months ended September 30, 2015.

Retained Liabilities and Legacy Settlement Charges

PPG has retained certain liabilities for defined benefit 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, the Company has made all contributions to the individual plan and has discharged the liability through either lump sum payments to participants or purchasing annuities.

During August and September 2016, PPG completed the wind-up of two legacy Canadian plans and recorded after-tax wind-up charges of $34 million (approximately $47 million pre-tax). Cash contributions made in conjunction with these windups were approximately $1 million . The Company recorded a settlement charge of $7 million in 2015 related to legacy plant closures. We expect limited additional settlement charges related to these legacy plant closures; although the Company retains the right to continue to review and potentially change other PPG defined benefit plans in the future.

Pension Annuity Contracts

In June 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.

On August 3, 2016, pursuant to the two Definitive Purchase Agreements, the Plans purchased group annuity contracts that irrevocably transferred 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. The value of the benefit obligation of each affected former salaried employee’s retirement benefit obligation is irrevocably guaranteed by, and split equally between, MassMutual and MetLife. Pursuant to these Definitive Purchase Agreements, MassMutual serves as the lead administrator. The value of each affected former hourly employee’s retirement benefit obligation is irrevocably guaranteed by MetLife, and MetLife will serve as the administrator. The amount of each affected retiree’s annuity payment is equal to the amount of such individual’s pension benefit. The purchase of group annuity contracts was funded directly by the assets of the Plans.

By irrevocably transferring the obligations to MassMutual and MetLife, the Company reduced its overall pension projected benefit obligation by approximately $1.6 billion and recognized a non-cash pension settlement charge of approximately $535 million after-tax (approximately $857 million pre-tax) in the third quarter of 2016.

The Company made contributions aggregating $50 million to the Plans during the third quarter 2016 and expects to make contributions aggregating approximately $125 million to the Plans in the fourth quarter 2016 and the first half of 2017. These contributions will be funded by cash on hand.

U.S. Plan Merger & Remeasurement

During the third quarter 2016, as a result of the purchase of group annuity contracts, PPG merged two of its qualified defined benefit pension plans that contained retired plan participants into one surviving plan. Prior to the merger and the calculation of the settlement charge, as required, PPG remeasured its qualified pension plan obligations using prevailing discount rates as of July 31, 2016 which averaged 3.6% as compared to a 4.5% discount rate as of December 31, 2015. The remeasurement increased the Company's cumulative pension benefit obligation of its remaining plans by $306 million and increased the Company's full year 2016 qualified defined benefit pension expense by approximately $10 million .

Canadian Pension Annuity Contracts

On August 25, 2016, the Company purchased group annuity contracts that transferred pension benefit obligations for certain of the Company's retirees and terminated vested participants in Canada who started receiving their monthly retirement benefit payments on or before April 1, 2016 to Sun Life Assurance Company of Canada ("Sun Life") and The Canada Life Assurance Company ("Canada Life"). The amount of each affected retiree's annuity payment is equal to the amount of such individual's pension benefit. The purchase of group annuity contracts was funded directly by the assets of the Canadian plans. By transferring the obligations to Sun Life and Canada Life, the Company reduced its overall pension projected benefit obligation by approximately $200 million and recognized a non-cash pension settlement charge of $47 million after-tax ($64 million pre-tax) in the third quarter of 2016. The Company made contributions aggregating approximately $7 million to the Canadian plans in the third quarter 2016. These contributions were funded by cash on hand.

U.S. Postretirement Medical

On August 4, 2016, the Company communicated plan design changes to certain Medicare-eligible retiree plan participants. Effective January 1, 2017, the Company-sponsored Medicare-eligible plans will be replaced by a Medicare private exchange. By offering retiree health coverage through a private Medicare exchange, PPG is able to provide Medicare-eligible participants with more choice of plans and plan designs, greater flexibility, and different price points for coverage. After January 1, 2017, PPG's contribution to coverage for Medicare-eligible retirees will be in the form of a tax-free account known as a Health Reimbursement Arrangement (HRA). The HRA can be used to pay for healthcare and prescription drug plan premiums and certain out-of-pocket medical costs; unused funds can be carried over to future years. PPG has the right to amend, modify, or terminate this benefit plan at any time.

The announcement of these plan design changes triggered a remeasurement of PPG's retiree medical benefit obligation using prevailing interest rates. The remeasurement and announced plan design change resulted in a $190 million net reduction in the Company's postretirement benefit obligation. PPG will account for the plan design change prospectively, and the plan change will reduce net periodic postretirement benefit cost by $54 million annually for 5.6 years . The Company's 2016 net periodic postretirement benefit cost will be approximately $25 million lower during the second half of the year than previously estimated.

11 . Shareholders' Equity

Changes to shareholders' equity for the nine months ended September 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	533	18	551
Other comprehensive income, net of tax	161	(1)	160
Cash dividends	(309)	—	(309)
Issuance of treasury stock	51	—	51
Stock repurchase program	(400)	—	(400)
Stock-based compensation activity	12	—	12
Dividends paid on subsidiary common stock to noncontrolling interests	—	(4)	(4)
Other	—	(9)	(9)
Balance, September 30, 2016	$ 5,031	$ 90	$ 5,121

($ in millions)	Total PPG Shareholders' Equity	Non-controlling Interests	Total
Balance, January 1, 2015	$ 5,180	$ 85	$ 5,265
Net income	1,092	17	1,109
Other comprehensive income, net of tax	(476)	(8)	(484)
Cash dividends	(287)	—	(287)
Issuance of treasury stock	69	—	69
Stock repurchase program	(501)	—	(501)
Stock-based compensation activity	34	—	34
Dividends paid on subsidiary common stock to noncontrolling interests	—	(3)	(3)
Other	—	(6)	(6)
Balance, September 30, 2015	$ 5,111	$ 85	$ 5,196

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	(157) [a]	—	—	(157)
Current year deferrals to AOCI, tax effected	(73) [b]	(267) [c]	(6) [d]	(346)
Reclassifications from AOCI to net income	—	658 [c]	6 [d]	664
Net change	$ (230)	$ 391	$ —	$ 161
Balance, September 30, 2016	$ (1,562)	$ (988)	$ 9	$ (2,541)
Balance, January 1, 2015	$ (628)	$ (1,492)	$ 4	$ (2,116)
Current year deferrals to AOCI	(679) [a]	—	—	(679)
Current year deferrals to AOCI, tax effected	88 [b]	40 [c]	(36) [d]	92
Reclassifications from AOCI to net income	—	69 [c]	42 [d]	111
Net change	$ (591)	$ 109	$ 6	$ (476)
Balance, September 30, 2015	$ (1,219)	$ (1,383)	$ 10	$ (2,592)

(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 nine months ended September 30, 2016 and 2015 was $(53) million and $23 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 nine months ended September 30, 2016 and 2015 was $(252) million and $50 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 nine months ended September 30, 2016 and 2015 was $(1) million and $2 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 September 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 nine month periods ended September 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 nine month periods ended September 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 September 30, 2016 and 2015 , the fair value of these contracts were insignificant.

Prior to June 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, in June 2016, the fair value of the renewable equity forward 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 September 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 September 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 $10 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 September 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 September 30, 2016 and December 31, 2015 , the fair value of these contracts was a net asset of $27 million and $41 million , respectively.

As of September 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 September 30, 2016 and December 31, 2015 was $2.1 billion and $2.0 billion , respectively.

Gains/Losses Deferred in AOCI

As of September 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 $269 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 nine months ended September 30, 2016 and 2015. All dollar amounts are shown on a pre-tax basis.

($ in millions)	September 30, 2016		
	Gain (Loss) Deferred in OCI	Gain Recognized	
Hedge Type		Amount	Caption
Cash Flow			
Foreign currency forward contracts [(a)]	$ 7	$ 8	Other charges
Total Cash Flow	$ 7	$ 8	
Net Investment			
Cross currency swaps	$ (13)		
Foreign denominated debt	(67)		
Total Net Investment	$ (80)		

(a) The ineffective portion related to this item was $7 million of expense.

($ in millions)	September 30, 2015		
	Gain Deferred in OCI	(Loss) Gain Recognized	
Hedge Type		Amount	Caption
Fair Value			
Equity forward arrangements	Not applicable	(76)	Asbestos settlement - net
Total Fair Value		$ (76)	
Cash Flow			
Foreign currency forward contracts [(a)]	59	53	Other charges
Total Cash Flow	$ 59	$ 53	
Net Investment			
Cross currency swaps	$ 64		
Foreign currency forward contracts	19		
Foreign denominated debt	28		
Total Net Investment	$ 111		
Economic			
Foreign currency forward contracts		$ 19	Other charges

(a) The ineffective portion related to this item was $5 million of expense.

Fair Value Measurements

The Company follows a fair value measurement hierarchy to measure its assets and liabilities. As of September 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 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 September 30, 2016 and December 31, 2015 that are classified as Level 3 inputs.

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

	September 30, 2016		
($ in millions)	Level 1	Level 2	Level 3
Assets:			
Other current assets:			
Marketable equity securities	$ 4	$ —	$ —
Foreign currency forward contracts	—	15	—
Investments:			
Marketable equity securities	79	—	—
Other Assets:			
Cross currency swaps	—	27	—
Liabilities:			
Accounts payable and accrued liabilities:			
Foreign currency forward contracts	—	5	—

	December 31, 2015		
($ in millions)	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	—

Long-Term Debt

($ in millions)	September 30, 2016 [(a)]	December 31, 2015 [(b)]
Long-term debt - carrying value	$ 3,738	$ 4,265
Long-term debt - fair value	$ 4,057	$ 4,367

(a) Excluding capital lease obligations of $17 million and short term borrowings of $649 million as of September 30, 2016 .

(b) Excluding capital lease obligations of $13 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 nine months ended September 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 9.7 million as of September 30, 2016 .

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

	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2016	2015	2016	2015
Stock-based compensation	$ 12	$ 2	$ 38	$ 42
Income tax benefit recognized	$ 3	$ 1	$ 13	$ 14

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

	Nine Months Ended September 30			
	2016		2015	
Grant Details	Shares	Fair Value	Shares	Fair Value
Stock options	705,334	$ 17.94	569,650	$ 26.94
Restricted stock units	251,824	$ 91.55	190,921	$ 113.75
Contingent shares (a)	62,116	$ 95.46	63,062	$ 117.91

(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 nine months ended September 30, 2016 was calculated with the following weighted average assumptions:

Weighted average exercise price	$ 95.29
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. During September 2016, legislation was passed in the foreign taxing jurisdiction which would preclude the assessment of interest for failure to meet the administrative criteria. The new legislation is subject to a 100-day period during which the public may seek a referendum on the legislation. If retroactive relief does not occur, PPG plans to vigorously defend against the assessment.

Asbestos Matters

For over 40 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 manufactured and distributed by PPG's former 50% affiliate Pittsburgh Corning Corporation ("PC"). Additionally, PPG faces claims alleging personal injury arising out of exposure to asbestos or asbestos-containing products manufactured, sold and/or distributed by PPG or its subsidiaries and claims alleging personal injury caused by asbestos on premises owned, leased or occupied by PPG. PPG has denied responsibility for, and has defended, all claims for any injuries caused by PC products.

Background of the Pittsburgh Corning Corporation Asbestos Bankruptcy

On April 16, 2000, PC filed for Chapter 11 in the U.S. Bankruptcy Court for the Western District of Pennsylvania. The Bankruptcy Court subsequently entered a series of orders enjoining the prosecution of asbestos litigation against PPG until after the effective date of a confirmed PC plan of reorganization. During the pendency of this injunction, PPG and certain of its historical liability insurers worked to negotiate a settlement that would resolve the Company's liability for PC-related asbestos claims through the creation of a trust pursuant to Section 524(g) of the Bankruptcy Code that would be funded in part by PPG and its participating insurers. That settlement was ultimately incorporated into a PC plan of reorganization that was confirmed by the Bankruptcy Court on May 24, 2013. On April 26, 2016, PC filed a notice advising the Bankruptcy Court that all conditions precedent set forth in the PC plan of reorganization had been waived or satisfied and that the effective date of the PC plan of reorganization would occur on April 27, 2016.

Asbestos Claims Subject to Bankruptcy Court's Channeling Injunction

In accordance with the PC plan of reorganization, the Bankruptcy Court entered a channeling injunction under Section 524(g) of the Bankruptcy Code that, by its terms, prohibits present and future claimants from asserting claims against PPG that arise, in whole or in part, out of exposure to 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 cases that are subject to the channeling injunction from asserting claims against PPG for contribution, indemnification or other recovery. The 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.

A trust has been established under Section 524(g) of the Bankruptcy Code (the "Trust") which has been created for the benefit of current and future asbestos claimants whose claims are channeled to the Trust by the channeling injunction. The Trust is the sole recourse for holders of PC Relationship Claims. PPG and its affiliates have no further liability or responsibility for, and will be permanently protected from, such asbestos claims.

PPG's Trust Funding Obligations

In accordance with the PC plan of reorganization, on April 26, 2016, PPG's equity interest in PC was canceled. On June 9, 2016 (the "Funding Effective Date"), PPG conveyed to the Trust the stock it owned in Pittsburgh Corning Europe and transferred to the Trust 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. PPG exercised that right and made a cash payment to the Trust in the amount of $764 million on the Funding Effective Date, thereby satisfying all of PPG's present and future cash payment obligations to the Trust. PPG's historical insurance carriers participating in the settlement memorialized in the PC plan of reorganization also are required to make cash payments to the Trust of approximately $1.7 billion between the Funding Effective Date and 2027.

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 also granted certain participating insurers full policy releases on primary policies and full product liability releases on excess coverage policies. Further, PPG granted certain other participating excess insurers credit against their product liability coverage limits.

The following table outlines the impact on PPG's financial statements for the nine months ended September 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.

	Consolidated Balance Sheet				
	Asbestos Settlement Liability		Equity Forward (Asset) Liability	Pre-tax Charge (Income)	Cash Outflow
($ in millions)	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)	—	—	—	—
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 nine months ended September 30, 2016	$ —	$ —	$ —	$ 5	$ (813)

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. While management believes that the vast majority of the approximately 114,000 claims pending against PPG in 2000 that alleged personal injury from exposure to asbestos were PC Relationship Claims, the potential liability for any non-PC Relationship Claims has been retained by PPG. Because a determination of whether an asbestos claim is a non-PC Relationship Claim will typically not be

known until shortly before trial, and because the filing and prosecution of asbestos claims (other than certain premises claims) against PPG was enjoined from April 2000 through August 2016, the actual number of non-PC Relationship Claims that are pending and the number of additional claims that may be filed against PPG in the future cannot be determined at this time.

In addition, 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 also been subject to the stay imposed by the Bankruptcy Court. 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 620 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. PPG currently faces approximately 260 active premises claims. PPG is engaged in the process of settling or otherwise resolving some of these claims while others remain in active litigation.

Although PPG has successfully defended asbestos claims brought against it in the past, in view of the number of claims, and the significant verdicts that other companies have experienced in asbestos litigation, the result of any future litigation of such claims is inherently unpredictable. PPG intends to defend against all asbestos claims vigorously, and their ultimate settlement or resolution in the court system is expected to occur over a period of years.

In 2009, PPG established a $162 million reserve for asbestos-related claims that will not be channeled to the Trust. This amount, which is included within "Other liabilities" on the accompanying consolidated balance sheets, 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 was in effect from April 2000 through August 2016. PPG will monitor the activity associated with asbestos claims which are not channeled to the Trust and evaluate, on a periodic basis, its estimated liability for such claims, its insurance assets then available to the Company, and all underlying assumptions to determine whether any adjustment to the reserve for these claims is required.

The amount reserved for asbestos-related claims by its nature is subject to many uncertainties that may change over time, including (i) the ultimate number of claims filed; (ii) the amounts required to resolve both currently known and future unknown claims; (iii) the amount of insurance, if any, available to cover such claims; (iv) the unpredictable aspects of the litigation process, including a changing trial docket and the jurisdictions in which trials are scheduled; (v) the outcome of any trials, including potential judgments or jury verdicts; (vi) the lack of specific information in many cases concerning exposure for which PPG is allegedly responsible, and the claimants’ alleged diseases resulting from such exposure; and (vii) potential changes in applicable federal and/or state tort liability law. All of these factors may have a material effect upon future asbestos-related liability estimates. As a potential offset to any future asbestos financial exposure, under the PC plan of reorganization PPG retained for its own account rights to recover proceeds from certain historical insurance assets, including policies issued by non-participating insurers. While the ultimate outcome of PPG’s asbestos litigation cannot be predicted with certainty, PPG believes that any financial exposure resulting from its asbestos-related claims will not have a material adverse effect on PPG’s consolidated financial position, liquidity or results of operations.

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 September 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)	September 30, 2016	December 31, 2015
New Jersey Chrome	$ 112	$ 133
Other	97	100
Total	$ 209	$ 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 nine months ended September 30, 2016 and 2015 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2016	2015	2016	2015
Environmental remediation pre-tax charges	$ 3	$ 3	11	9
Cash outlays for environmental remediation activities	$ 12	$ 18	35	84

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, New Jersey (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 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 $112 million at September 30, 2016 . The major cost components of this liability continue to be related to transportation and disposal of impacted soil, as well as construction services. These components each account for approximately 33% and 39% 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 (the United States Department of the Interior, acting through the United States Fish and Wildlife Service, the National Oceanic and Atmospheric Administration of the United States Department of Commerce, the Louisiana Department of Environmental Quality and the Louisiana Department of Wildlife and Fisheries) 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 $21 million as of September 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, coatings services 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 fiber glass operating segment. This reportable segment primarily supplies continuous-strand fiber glass products. The Glass segment historically included the results of the flat glass business, which was sold October 1, 2016. The results of operations and cash flows for this business have been recast as discontinued operations for all periods presented. The results of the European fiber glass business which was also sold October 1, 2016, have not been reclassified as discontinued operations, as the divestiture of the European fiber glass business did not have a major impact on PPG's ongoing results of operations.

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

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2016	2015	2016	2015
Net sales:				
Performance Coatings	$ 2,223	$ 2,240	$ 6,600	$ 6,705
Industrial Coatings	1,437	1,354	4,253	4,105
Glass	129	131	401	404
Total	$ 3,789	$ 3,725	$ 11,254	$ 11,214
Segment income:				
Performance Coatings	$ 368	$ 379	$ 1,075	$ 1,052
Industrial Coatings	249	241	806	745
Glass	12	6	41	27
Total	629	626	1,922	1,824
Corporate	(42)	(34)	(162)	(164)
Interest expense, net of interest income	(28)	(21)	(76)	(63)
Legacy items [(a)]	(4)	(9)	(26)	(30)
Asset write-downs	—	—	(14)	—
Gain from sale of equity affiliate	—	—	20	—
Pension settlement charges	(968)	(7)	(968)	(7)
Transaction-related costs [(b)]	—	(1)	(9)	(27)
Business restructuring	—	—	—	(140)
(Loss) Income from continuing operations before income taxes	$ (413)	$ 554	$ 687	$ 1,393

(a) 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 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.

(b) 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 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 and nine months ended September 30, 2016 :

- Net sales for the three months ended were $3.8 billion , up nearly two percent compared to the prior year, primarily due to higher sales volumes (+2%) and sales from acquired businesses (+2%), partially offset by unfavorable foreign currency translation (-2%).
- Net sales for the nine months ended were $11.3 billion , consistent with the prior year, primarily due to sales from acquired businesses (+2%) and higher sales volumes (+1%), offset by unfavorable foreign currency translation (-3%).
- Cost of sales, exclusive of depreciation and amortization was $2.1 billion , up 1.6% for the three months ended September 30, 2016 and was $6.1 billion , down 1.8% for the nine months ended September 30, 2016.
- Selling, general and administrative ("SG&A") expense was $0.9 billion , up 2.7% for the three months ended September 30, 2016 and was $2.7 billion , up 1.1% for the nine months ended September 30, 2016. As a percentage of sales, SG&A increased 0.2% for the three and nine months ended September 30, 2016, respectively.
- (Loss) income before income taxes was $(413) million and $687 million for the three and nine months ended September 30, 2016, respectively.
- The effective tax rate for the three months and nine months ended September 30, 2016 was 52.5% and 26.5% , respectively.
- Net (loss) income from continuing operations was $(201) million and $487 million for the three and nine months ended September 30, 2016, respectively.
- (Loss) earnings per diluted share from continuing operations was $(0.75) and $1.81 for the three and nine months ended September 30, 2016, respectively.
- Cash flows from operating activities - continuing operations decreased $266 million year over year for the nine months ended September 30, 2016. Operating cash flow decreased primarily due to funding of the asbestos settlement trust ($813 million) partially offset by lower cash tax payments ($15 million), lower working capital ($258 million) and lower pension contributions ($192 million).
- Capital expenditures, including acquisitions (net of cash acquired), was $579 million for the nine months ended September 30, 2016.
- During the nine months ended September 30, 2016 , the Company paid $309 million in dividends and also repurchased approximately $400 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 Third Quarter of 2016 Compared to the Third Quarter of 2015

Performance Overview

Net Sales

($ in millions, except percentages)	Three Months Ended September 30		Percent Change
	2016	2015	2016 vs. 2015
The Americas			
United States and Canada	$ 1,716	$ 1,677	2.3 %
Latin America	359	355	1.1 %
Europe, Middle East and Africa (EMEA)	1,094	1,098	(0.4)%
Asia-Pacific	620	595	4.2 %
Total	$ 3,789	$ 3,725	1.7 %

2016 vs. 2015

Net sales increased $64 million due to the following:

- Net sales attributable acquired businesses (+2%)
- Sales volumes (+2%)

Partially offset by:

- Foreign currency translation (-2%)

Acquired businesses added approximately $90 million of sales in 2016, primarily MetoKote, supplemented by several other acquisitions made in 2015.

In the U.S. and Canada region, sales volumes declined modestly, with flat coatings volumes and lower fiber glass volumes. Results were mixed by business unit with growth in aerospace and automotive refinish coatings. Architectural coatings sales volumes grew year-over-year versus a weak comparable period that included sales volume declines in the prior year. Above market growth continued in packaging coatings, due to continued customer conversions to PPG's new interior can coatings technologies. General industrial coatings, fiber glass and automotive OEM coatings declined due in part to soft industrial production in the region.

In Latin America, sales volumes grew in aggregate by a mid-single-digit percentage led by architectural, packaging, general industrial, and automotive OEM coatings. Within the region, sales volumes continued to grow in Mexico and Central America and declined in Brazil due to weak overall economic conditions there.

Modest sales volume growth occurred in Europe, Middle East, Africa (EMEA), aided by fiber glass. Our coatings segment sales volumes were flat in the EMEA region after expanding for the prior six quarters. PPG’s above market regional growth in our automotive OEM and general industrial coatings and specialty coatings and materials businesses was offset by modest declines (in line with overall industry demand patterns) in architectural coatings, packaging and automotive refinish coatings.

Year-over-year sales volume growth in Asia-Pacific accelerated versus the first and second quarters of 2016 increasing by a mid-to-high single digit percentage, with solid volume gains in automotive OEM, general industrial and refinish coatings. From a country and sub-region perspective, sales volumes grew in China, India and southeast Asia versus the prior year and Korean volumes declined primarily due to lower marine shipbuilding activity.

Foreign currency translation reduced net sales by about $65 million as the U.S. dollar strengthened against most foreign currencies versus the prior year, notably the Mexican peso, British pound and Chinese yuan.

Cost of Sales, exclusive of depreciation and amortization

($ in millions, except percentages)	Three Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Cost of sales, exclusive of depreciation and amortization	$ 2,081	$ 2,049	1.6 %
Cost of sales as a percentage of net sales	54.9%	55.0%	(0.1)%

2016 vs. 2015

Cost of sales, exclusive of depreciation and amortization, increased $32 million (+1.6%) including the following:

- *Higher sales volumes*
- *Cost of sales attributable to acquired businesses*

Partially offset by:

- *Lower manufacturing costs*
- *Foreign currency translation*
- *Restructuring cost savings*

Selling, general and administrative expenses

($ in millions, except percentages)	Three Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Selling, general and administrative expenses (SG&A)	$ 899	$ 875	2.7%
Selling, general and administrative expenses as a percentage of net sales	23.7%	23.5%	0.2%

2016 vs. 2015

SG&A increased $24 million (+2.7%) due to the following:

- *Growth-related spending, including support for the launch of new architectural coatings retail products*
- *Overhead cost inflation*
- *SG&A expenses attributable to acquired businesses*

Partially offset by:

- *Foreign currency translation*
- *Restructuring cost savings*

Other costs and income

($ in millions, except percentages)	Three Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Interest expense, net of Interest income	$ 28	$ 21	33.3 %
Other charges	$ 13	$ 21	(38.1)%
Other income	$ (23)	$ (35)	(34.3)%

Interest expense, net of Interest income

Interest expense, net of Interest income increased $7 million from the prior year due to lower Interest income earned on deposits.

Other charges

Other charges decreased $8 million from the prior year due to the absence of certain prior year foreign currency losses.

Other income

Other income decreased $12 million from the prior year driven by lower equity earnings and the absence of a prior year one-time gain related to the acquisition of a former partner's ownership interest in a joint venture.

Effective tax rate and earnings per diluted share

($ in millions, except percentages)	Three Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Income tax (benefit) expense	$ (217)	$ 133	(263.2)%
Effective tax rate	52.5%	24.0%	28.5 %
Adjusted effective tax rate, continuing operations*	24.4%	24.0%	0.4 %
(Loss) earnings per diluted share, continuing operations	$ (0.75)	$ 1.52	(149.3)%
Adjusted earnings per diluted share*	$ 1.56	$ 1.54	1.3 %

*See Regulation G Reconciliation.

The full year effective tax rate for 2016 is expected to be higher than 2015 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 for the three months ended September 30, 2016 includes a net tax benefit of $352 million associated with the U.S. and Canadian pension settlement charges. Refer to Note 9, "Income Taxes" for a discussion of the tax benefit.

Reported loss per diluted share for the three months ended September 30, 2016 declined year-over-year from 2015, primarily due to the pension settlement charges recognized during the third quarter 2016. The Company benefited from the 7.0 million shares repurchased in 2015 and 4.0 million shares repurchased in the first nine months 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:

	Three months ended September 30, 2016				
($ in millions, except percentages and per share amounts)	(Loss) Income Before Income Taxes	Tax (Benefit) Expense	Effective Tax Rate	Net (loss) income from continuing operations (attributable to PPG)	Earnings per diluted share
As reported, continuing operations	$ (413)	$ (217)	52.5%	$ (201)	$ (0.75)
Adjusted for:					
Pension settlement charges	968	352	36.4%	616	2.31
Adjusted, continuing operations, excluding certain charges	$ 555	$ 135	24.4%	$ 415	$ 1.56

	Three months ended September 30, 2015				
($ in millions, except percentages and per share amounts)	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	$ 554	$ 133	24.0%	$ 415	$ 1.52
Adjusted for:					
Transaction-related costs [1]	1	—	—	1	—
Pension settlement charge	7	2	26.7%	5	0.02
Adjusted, continuing operations, excluding certain charges	$ 562	$ 135	24.0%	$ 421	$ 1.54

(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

($ in millions, except per share amounts)	Three Months Ended September 30 2016	2015	$ Change 2016 vs. 2015	% Change 2016 vs. 2015
Net sales	$ 2,223	$ 2,240	$ (17)	(0.8)%
Segment income	$ 368	$ 379	$ (11)	(2.9)%

2016 vs. 2015

Performance Coatings net sales decreased $17 million (-1%) due to the following:

- *Unfavorable foreign currency translation of approximately $45 million (-2%)*

Partially offset by:

- *Higher sales volumes (+0.6%)*
- *Net sales from acquisitions (+0.6%)*

Architectural coatings - EMEA sales volumes declined by a low-single-digit percentage year-over-year, however, the rate of decline was modestly higher than the prior sequential quarter. Sales volumes flattened in western Europe, remaining mixed by country and declined in central Europe versus the prior year.

Architectural coatings - Americas and Asia-Pacific sales volumes increased a low-to-mid-single-digit percentage in the third quarter versus a weak comparable prior year period. Sales volumes stabilized in China during the third quarter and were consistent with prior year. Brazilian sales volumes declined a double-digit percentage year-over-year due to ongoing weakness in overall economic activity, continuing the declining sales volume trend from recent quarters. In the U.S. and Canada, sales volumes in the company-owned store channel improved year-over-year for the third consecutive quarter, mainly due to recent growth-related investments and initiatives. Sales volumes in the national retail accounts ("do-it-yourself" or DIY) channel improved a mid-single-digit percentage compared to volume declines in the prior year period, which included higher sales of certain new PPG DIY products, supported by traditional new product marketing and promotional campaigns. Sales volumes were flat year-over-year in the U.S. independent dealer channel, an improvement versus prior year results. In Mexico, local currency architectural coatings sales grew a mid-to-high single-digit percentage, more than double the Mexican GDP growth rate. Robust sales growth also continued in Central America year-over-year, building on the 2015 acquisition of Consorcio LatinAmericano which provided an initial sales presence in the region. The Company's retail distribution network has grown to include approximately 300 points of sale across Central America.

Protective and marine coatings sales volumes declined by a mid-single-digit percentage year-over-year, primarily driven by lower shipbuilding activity in Asia-Pacific and decreased demand for marine aftermarket products. The declines more than offset protective coatings sales volumes improvements versus prior year, led by gains in the U.S .and Canada.

Aerospace coatings sales volumes growth continued, increasing by a low-single digit percentage versus the prior year, consistent with the industry and second quarter 2016 growth rates. Regionally, sales volume growth was led by the U.S. and Canada, with modest demand in other regions.

Automotive refinish coatings organic sales grew at a low-to-mid-single-digit percentage year-over-year, reflecting higher end-market demand in Asia-Pacific partially offset by modest declines in Europe due to demand weakness in central Europe.

Segment income decreased $11 million (-3%) year-over-year primarily due to unfavorable foreign currency translation, which reduced segment income by $10 million (Mexican peso, British pound) and about $15 million of incremental growth-related spending for new architectural products, partially offset by lower manufacturing costs, including business restructuring benefits, acquisition-related income and income from higher sales volumes.

Looking Ahead

In the fourth quarter, we expect lower segment sales sequentially due to normal seasonal business patterns, including the seasonal decline in the U.S., Canada, and European architectural coatings businesses. All prior acquisitions for the segment reached their one-year anniversary by the end of the third quarter. For automotive refinish, we anticipate similar growth patterns due to a continuation of favorable end-use market trends and the ongoing adoption of PPG’s market leading waterborne coatings. For aerospace, we anticipate a continuation of similar year-over-year sales volume trends in the fourth quarter. We expect fourth quarter year-over-year demand in the U.S. and Canadian architectural coatings businesses to remain modest due to demand weakness in the independent dealer channel and at certain national retail (DIY) accounts, partially offset by continued improvement in the company-owned store channel. Above market performance is expected to continue in Mexico and Central America on increased fourth quarter sales due to normal business seasonality. We expect flat-to-lower demand in our architectural EMEA business year-over-year. We

also anticipate a continuation of very weak marine end-use market demand more than offsetting growth in the protective coatings sub-segment.

Based on current exchange rates, we expect foreign currency translation to remain unfavorable year-over-year, similar to the third quarter, led by the continued weakness of the Mexican peso and British pound versus the U.S. dollar.

Industrial Coatings

	Three Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	$ 1,437	$ 1,354	$ 83	6.1%
Segment income	$ 249	$ 241	$ 8	3.3%

2016 vs. 2015

Industrial Coatings segment net sales increased (+6%) due to the following:

- *Net sales attributable to acquired businesses (+5%)*
- *Higher sales volumes (+4%), led by growth in Asia Pacific and Europe.*

Partially offset by:

- *Unfavorable foreign currency translation of approximately $15 million (-1%)*
- *Lower selling prices*

PPG's global automotive OEM coatings sales volumes increased by a low-to-mid-single digit percentage, generally consistent with global industry growth rates. Year-over-year growth rates were highest in Asia partially due to a weak comparable period in the prior year. Regional sales volume growth continued in Europe and expanded in Latin America, but volumes declined in the U.S. and Canada versus prior year.

Global general industrial coatings and specialty coatings and materials sales volumes, in aggregate, grew a low-to-mid-single-digit percentage year-over-year outpacing global industrial production, similar to previous quarters. Demand levels remained mixed by end-use market and geography, with strong year-over-growth in Asia-Pacific partially offset by continued softness in certain U.S. and Canada industrial end-use markets. Overall, volume growth continued in automotive parts and accessories, coil and extrusion, and electronics materials.

Packaging coatings sales volumes were up a low-to-mid single-digit percentage year-over-year, driven by continued strong sales growth momentum in the U.S. and Asia-Pacific regions related to the adoption of PPG's new interior can coatings technologies.

Segment income increased $8 million (+3%) year-over-year primarily due to lower manufacturing costs including business restructuring benefits and income from higher sales volumes, partially offset by lower selling prices, overhead cost inflation and unfavorable foreign currency translation ($5 million). Acquisition-related income contributed to income growth but at margins which are currently below the segment average.

Looking ahead

In the fourth quarter 2016, we expect net sales to be lower sequentially versus the third quarter due to normal seasonal business patterns. We anticipate acquisition-related sales of about $45 million, lower in comparison to the third quarter due to the IVC and Le Joint Français acquisitions reaching their one-year anniversary in the third quarter. We anticipate fourth quarter automotive OEM industry builds to increase modestly year-over-year, but at a slower growth rate sequentially as demand levels are expected to flatten in Asia-Pacific due to strong prior year growth. For our general industrial coatings and specialty coatings and materials businesses, we expect overall industry growth trends to remain consistent in the fourth quarter, but to vary by region and end-use market. We anticipate above market packaging coatings sales volume growth to continue in the fourth quarter in comparison to a strong prior year period. Based on current exchange rates, we expect foreign currency translation to remain unfavorable year-over-year, similar to the third quarter, including ongoing weakness in the Mexican peso versus the U.S. dollar.

Glass

($ in millions, except per share amounts)	Three Months Ended September 30		$ Change	% Change
	2016	2015	2016 vs. 2015	2016 vs. 2015
Net sales	$ 129	$ 131	$ (2)	(1.5)%
Segment income	$ 12	$ 6	$ 6	100.0 %

2016 vs. 2015

Glass segment net sales decreased (-1.5%) due to the following:

- *Unfavorable foreign currency translation (-2%)*

Partially offset by:

- *Slightly higher sales volumes (0.5%)*

Fiber glass sales volumes increased slightly year-over-year, with growth in Europe, across most end-use markets, partially offset by declines in the U.S. and Canada region.

Segment income increased $6 million (100%) year-over-year, primarily due to aggressive cost management, including business restructuring benefits.

Looking ahead

In the fourth quarter 2016, we anticipate modestly lower sales due to normal business seasonality. In addition, we expect a modest deceleration in certain end-use markets in the U.S. and Canada. We do not anticipate foreign currency translation to impact the business year-over-year.

In the third quarter, PPG announced the sale of its 50 percent ownership interest in its two PFG Asian fiber glass joint ventures. The transaction is expected to close by year-end 2016. On October 1, 2016, PPG completed the sale of its flat glass business with annual revenues of approximately $550 million and the sale of its European fiber glass business with annual revenues of approximately $150 million. Starting in the fourth quarter, the segment will include the U.S. and Canada fiber glass business only, which has annual sales of approximately $350 million.

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

Performance Overview

Net Sales

($ in millions, except percentages)	Nine Months Ended September 30		Percent Change
	2016	2015	2016 vs. 2015
The Americas			
United States and Canada	$ 5,089	$ 5,062	0.5 %
Latin America	1,019	1,080	(5.6)%
Europe, Middle East and Africa (EMEA)	3,357	3,266	2.8 %
Asia Pacific	1,789	1,806	(0.9)%
Total	$ 11,254	$ 11,214	0.4 %

2016 vs. 2015

Net sales increased $40 million due to the following:

- *Unfavorable foreign currency translation (-3%)*

Partially offset by:

- *Net sales attributable to acquired businesses (+2%)*
- *Higher sales volumes (+1%)*

Foreign currency translation reduced net sales by $290 million as the U.S. dollar strengthened against most foreign currencies versus the prior year, notably the Mexican peso, Chinese yuan and British pound. These were partially offset by modest strengthening of the Euro versus the U.S. dollar.

Acquired businesses added approximately $260 million of sales in 2016, primarily Revocoat, IVC, LJF, MetoKote and several other acquisitions made in 2015.

Sales volume growth occurred across all regions, except the U.S. and Canada, where sales volumes declined.

Cost of Sales, exclusive of depreciation and amortization

($ in millions, except percentages)	Nine Months Ended September 30		Percent Change
	2016	2015	2016 vs. 2015
Cost of sales, exclusive of depreciation and amortization	6,095	6,209	(1.8)%
Cost of sales as a percentage of net sales	54.2%	55.4%	(1.2)%

2016 vs. 2015

Cost of sales, exclusive of depreciation and amortization, decreased $114 million (-1.8%) due to the following:

- *Lower manufacturing costs*
- *Foreign currency translation*
- *Restructuring cost savings*

Partially offset by:

- *Cost of sales attributable to acquired businesses*
- *Higher sales volumes*

Selling, general and administrative expenses

($ in millions, except percentages)	Nine Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Selling, general and administrative expenses (SG&A)	2,746	2,715	1.1%
Selling, general and administrative expenses as a percentage of net sales	24.4%	24.2%	0.2%

2016 vs. 2015

SG&A expenses increased $31 million (+1.1%) due to the following:

- *Overhead cost inflation*
- *Increased architectural coatings U.S. and Canada business spending of approximately $30 million on new product launches and other growth-related initiatives at major national accounts.*
- *Higher variable compensation costs, professional services and marketing costs*
- *SG&A expenses attributable to acquired businesses*

Partially offset by:

- *Foreign currency translation*
- *Restructuring cost savings*

Other costs and income

($ in millions, except percentages)	Nine Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Interest expense, net of Interest income	$ 76	$ 63	20.6 %
Other charges	$ 66	$ 71	(7.0)%
Other income	$ (88)	$ (92)	(4.3)%

Interest expense, net of Interest income

Interest expense, net of Interest income increased $13 million versus the prior year due to lower interest income earned on deposits.

Other charges

Other charges decreased $5 million from the prior year due to the absence of certain prior year foreign currency losses.

Other income

Other income decreased $4 million from the prior year due to lower equity affiliate income, lower royalty income and the absence of a prior year one-time gain related to the acquisition of a former partner's ownership interest in a joint venture, partially offset by a $20 million pre-tax gain on the sale of PPG's minority ownership interest in an equity affiliate.

Effective tax rate and earnings per diluted share

($ in millions, except percentages)	Nine Months Ended September 30 2016	2015	Percent Change 2016 vs. 2015
Income tax expense	182	333	(45.3)%
Effective tax rate	26.5%	23.9%	2.6 %
Adjusted effective tax rate, continuing operations*	24.4%	24.1%	0.3 %
Earnings per diluted share, continuing operations	$ 1.81	$ 3.80	(52.4)%
Adjusted earnings per diluted share*	$ 4.62	$ 4.27	8.2 %

*See Regulation G Reconciliation.

The full year effective tax rate for 2016 is expected to be higher than the comparable 2015 rate 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 nine months ended September 30, 2016 includes a tax benefit of $352 million associated with

the U.S. and Canadian pension settlement charges and 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 these tax components.

Reported earnings per diluted share for the nine months ended September 30, 2016 declined year-over-year from 2015, due principally to the pension settlement charges recorded during the third quarter 2016. The Company benefited from the 7.0 million shares repurchased in 2015 and 4.0 million shares repurchased in the first nine months 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:

	Nine months ended September 30, 2016				
($ in millions, except percentages and per share amounts)	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	687	182	26.5%	$ 487	$ 1.81
Adjusted for:					
Gain from sale of equity investment	(20)	(7)	37.6%	(13)	(0.05)
Transaction-related costs [1]	9	3	37.6%	6	0.03
Net tax effect of asbestos settlement funding	—	(128)	—	128	0.48
Asset write-downs	14	4	28.6%	11	0.04
Pension settlement charges	968	352	36.4%	616	2.31
Adjusted, continuing operations, excluding certain charges	$ 1,658	$ 406	24.4%	$ 1,235	$ 4.62

	Nine months ended September 30, 2015				
($ in millions, except percentages and per share amounts)	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	1,393	333	23.9%	$ 1,043	$ 3.80
Includes:					
Transaction-related costs [1]	27	8	29.6%	19	0.06
Business restructuring	140	34	24.3%	106	0.39
Pension settlement charge	7	2	26.7%	5	0.02
Adjusted, continuing operations, excluding certain charges	$ 1,567	$ 377	24.1%	$ 1,173	$ 4.27

(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

	Nine Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	**2016**	**2015**	**2016 vs. 2015**	**2016 vs. 2015**
Net sales	6,600	6,705	$ (105)	(1.6)%
Segment income	1,075	1,052	$ 23	2.2 %

2016 vs. 2015

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

- *Unfavorable foreign currency translation of approximately $190 million (-3%)*

Partially offset by:

- *Net sales attributable to acquired businesses (+1%)*
- *Slightly higher selling prices*

Architectural coatings - EMEA sales volumes were flat year-over-year as growth in western Europe early in the year was mitigated by demand weakness in the second and third quarters, including a sales volume decline in central Europe and flattening sales volumes in western Europe.

Architectural coatings - Americas and Asia Pacific organic sales were flat versus the prior year. In the U.S. and Canada, sales volumes advanced in the company-owned store channel versus the prior year, mainly due to recent growth-related investments and initiatives. The increase in the company-owned stores channel was more than offset by sales volume declines in the national retail (DIY) accounts channel and U.S. independent dealer channel year-over-year, despite DIY channel strengthening in the third quarter. Latin America organic sales were up year-over-year, led by Mexico which grew at more than double the Mexican GDP growth rate due to continued market penetration from more than 150 new store openings year-to-date.

Protective and marine coatings net sales volumes declined a low-single-digit-percentage year-over-year as growth in protective coatings was offset by declines in marine coatings, primarily due to lower shipbuilding activity in Asia-Pacific, decreased demand for marine aftermarket products 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. 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 customer inventory management early in the year. Sales growth occurred in all major regions, led by Asia Pacific.

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 $23 million (+2%) year-over-year, primarily due to continued strong cost management, including business restructuring benefits, slightly higher selling prices and acquisition-related income, partially offset by the impact of approximately $30 million of planned incremental costs for new product launches and other growth-related initiatives in major U.S. architectural coatings national accounts and unfavorable foreign currency translation ($30 million).

Industrial Coatings

($ in millions, except per share amounts)	Nine Months Ended September 30 2016	2015	$ Change 2016 vs. 2015	% Change 2016 vs. 2015
Net sales	4,253	4,105	$ 148	3.6%
Segment income	806	745	$ 61	8.2%

2016 vs. 2015

Industrial Coatings segment net sales increased (+4%) due to the following:

- *Net sales attributable to acquired businesses (+5%)*
- *Higher sales volumes (+2%), led by growth in Europe.*

Partially offset by:

- *Unfavorable foreign currency translation of approximately $100 million (-2%)*
- *Lower selling prices (-1%)*

PPG's global automotive OEM coatings business sales volumes increased a low-single-digit-percentage over the prior year, consistent with modest global automotive industry production growth. PPG's sales volumes differed by region, led by year-over-year growth in Europe and Asia-Pacific, while U.S. and Canada sales volumes declined.

Global general 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-Pacific sales volumes increased, while sales volumes declined in the U.S. and Canada. Sales volumes in Latin America advanced moderately.

Global packaging coatings sales volumes were up a mid-to-high single-digit percentage year-over-year, driven primarily by continued strong sales growth momentum related to the adoption of PPG's new interior can coatings technologies.

Segment income increased $61 million (+8%) year-over-year primarily due to lower manufacturing costs, including business restructuring benefits, income from higher sales volumes and acquisition-related income, partially offset by lower selling prices and unfavorable foreign currency translation ($15 million).

Glass

($ in millions, except per share amounts)	Nine Months Ended September 30 2016	2015	$ Change 2016 vs. 2015	% Change 2016 vs. 2015
Net sales	401	404	$ (3)	(0.7)%
Segment income	41	27	$ 14	51.9 %

2016 vs. 2015

Glass segment net sales decreased (-0.7%) due to the following:

- *Unfavorable foreign currency translation (-1.2%)*

Partially offset by:

- *Higher sales volumes (+0.6%)*

Fiber glass sales volumes increased 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 $14 million (52%) primarily due to disciplined cost management, including business restructuring benefits, partially offset by unfavorable product mix in third quarter and lower equity earnings, driven by weaker consumer electronics demand in Asia in the first half of 2016.

Liquidity and Capital Resources

PPG had cash and short-term investments totaling approximately $1.0 billion and $1.5 billion at September 30, 2016 and December 31, 2015 , respectively.

Cash used for operating activities - continuing operations for the nine months ended September 30, 2016 was $667 million . Cash from operating activities - continuing operations was $933 million for the nine months ended September 30, 2015 . Operating cash flow decreased primarily due to funding of the asbestos settlement trust ($813 million) offset by lower cash tax payments ($15 million), lower working capital ($258 million) and lower pension contributions ($192 million).

Other approximate uses of cash during the nine months ended September 30, 2016 included:

- Capital expenditures, excluding acquisitions, of $258 million , or about 2% of sales.
- Voluntary contributions to PPG's U.S. pension plans of $50 million.
- Mandatory contributions to PPG's non-U.S. pension plans of $28 million.
- Cash dividends paid totaled $309 million .
- Cash spent on share repurchases totaled $400 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 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.

Total capital spending in 2016 is expected to be in the range of 3.0% to 3.5% of full year sales. PPG expects to make contributions aggregating approximately $125 million to its U.S. defined benefit pension plans in the fourth quarter 2016 and during 2017. Also, PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of $5 million to $15 million in the fourth quarter 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 $1.85 billion, and we expect to deploy at least $650 million in the fourth quarter 2016.

PPG's total debt to equity ratio (total debt, including capital leases, to total debt and PPG shareholders’ equity) was 47% at September 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)	September 30, 2016 (a) (b)	December 31, 2015 (b)	September 30, 2015 (b)
Trade Receivables, Net	$ 2,635	$ 2,343	$ 2,635
Inventories, FIFO	1,811	1,803	1,942
Trade Creditors' Liabilities	1,996	1,886	2,006
Operating Working Capital	$ 2,450	$ 2,260	$ 2,571
Operating Working Capital as a % of Sales	16.2%	15.9%	17.3%
Days sales outstanding	55	54	55

(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 September 30, 2016.

(b) Reclassifications for Assets and Liabilities held for sale related to the flat glass business for all periods presented.

Other Liquidity Information

	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	**2016**	**2015**	**2016**	**2015**
Cash outlays for environmental remediation activities	$ 12	$ 18	$ 35	$ 84

($ in millions)	Remainder of 2016	2017	Annually 2018 - 2020
Projected future cash outlays for environmental remediation activities	$10 - $20	$50 - $70	$25 - $45

On October 1, 2016, PPG sold the net assets of its flat glass manufacturing and glass coatings operations to Vitro S.A.B. de C.V. PPG received approximately $750 million in cash proceeds. PPG reported the assets and liabilities of the flat glass business as "Assets held for sale" and "Liabilities held for sale" in the accompanying condensed consolidated balance sheets and the results of operations of the flat glass business as discontinued operations on the condensed consolidated statements of income and cash flows for all periods presented.

On October 1, 2016, PPG sold its European fiber glass operations to glass manufacturer Nippon Electric Glass Co. Ltd. ("NEG"). PPG received cash proceeds of approximately $120 million. PPG reported the assets and liabilities of the flat glass business as "Assets held for sale" and "Liabilities held for sale" in the accompanying condensed consolidated balance sheet as of September 30, 2016.

On September 22, 2016, PPG reached an agreement to divest its 50 percent ownership interests in its two PFG fiber glass joint ventures (PFG) to Nan Ya Plastics Corporation (Nan Ya), which currently controls the other 50 percent ownership interest in the joint ventures. Nan Ya is affiliated with Taiwan-based Formosa Plastics Group. The transaction is expected to close by the end of 2016 and PPG expects to receive cash proceeds of approximately $170 million .

In June 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, 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. On August 31, 2016, Westlake Chemical Corporation acquired Axiall, which became a wholly-owned subsidiary of Westlake. PPG is currently negotiating the terms of its purchase of CPDC's 40% ownership interest.

Pension Annuity Contracts

In June 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.

On August 3, 2016, pursuant to the two Definitive Purchase Agreements, the Plans purchased group annuity contracts that irrevocably transferred 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. The value of the benefit obligation of each affected former salaried employee's retirement benefit obligation is irrevocably guaranteed by, and split equally between, MassMutual and MetLife. Pursuant to these Definitive Purchase Agreements, MassMutual serves as the lead administrator. The value of each affected former hourly employee's retirement benefit obligation is irrevocably guaranteed by MetLife, and MetLife will serve as the administrator. The amount of each affected retiree's annuity payment is equal to the amount of such individual's pension benefit. The purchase of group annuity contracts was funded directly by the assets of the Plans.

By irrevocably transferring the obligations to MassMutual and MetLife, the Company reduced its overall pension projected benefit obligation by approximately $1.6 billion and recognized a non-cash pension settlement charge of approximately $535 million after-tax (approximately $857 million pre-tax) in the third quarter of 2016.

The Company made contributions aggregating $50 million to the Plans during the third quarter 2016 and expects to make contributions aggregating approximately $125 million to the Plans in the fourth quarter 2016 and during 2017. These contributions will be funded by cash on hand.

Canadian Pension Annuity Contracts

On August 25, 2016, the Company purchased group annuity contracts that transferred pension benefit obligations for certain of the Company's retirees and deferred vested participants in Canada who started receiving their monthly retirement benefit payments on or before April 1, 2016 to Sun Life Assurance Company of Canada ("Sun Life") and The Canada Life Assurance Company ("Canada Life"). The amount of each affected retiree's annuity payment is equal to the amount of such individual's pension benefit. The purchase of group annuity contracts was funded directly by the assets of the Canadian plans. By transferring the obligations to Sun Life and Canada Life, the Company reduced its overall pension projected benefit obligation by approximately $200 million and recognized a non-cash pension settlement charge of $47 million after-tax ($64 million pre-tax) in the third quarter of 2016. The Company made contributions aggregating approximately $7 million to the Canadian plans in the third quarter 2016.

Currency

Comparing exchange rates from December 31, 2015 to September 30, 2016 , the U.S. dollar weakened against numerous currencies in which PPG operates, most notably the Euro and the Canadian dollar. The US dollar strengthened against the Mexican peso and British pound over this same period. As a result, consolidated net assets at September 30, 2016 decreased by $231 million, compared to December 31, 2015 .

Comparing exchange rates during the first nine months of 2016 to those of the first nine months of 2015 , the U.S. dollar strengthened against the currencies of most countries in which PPG operates, most notably the Mexican peso and British pound. This had an unfavorable impact on pre-tax income from continuing operations for the nine months ended September 30, 2016 of $43 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 no later than 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 Quarterly 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 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 September 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 $260 million and $242 million as of September 30, 2016 and December 31, 2015 , respectively.

The fair value of foreign currency forward contracts outstanding during the nine months ended September 30, 2016 and 2015 were $8 million and $10 million, respectively. The potential reduction in PPG's income from continuing operations resulting from the impact of adverse changes in exchange rates on the fair value of its outstanding foreign currency hedge contracts of 10% for European and Canadian currencies and 20% for Asian and Latin American currencies for the nine months ended September 30, 2016 and 2015 were $107 million and $25 million, respectively.

Otherwise, there were no other material changes in the Company’s exposure to market risk from December 31, 2015 to September 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 (the United States Department of the Interior, acting through the United States Fish and Wildlife Service, the National Oceanic and Atmospheric Administration of the United States Department of Commerce, the Louisiana Department of Environmental Quality and the Louisiana Department of Wildlife and Fisheries) 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 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 third quarter of 2016 , the directors, as a group, were credited with 1,193 common stock equivalents under this plan. The value of each common stock equivalent, when credited, is $102.76.

Issuer Purchases of Equity Securities

The following table summarizes the Company's stock repurchase activity for the three months ended September 30, 2016 :

Month	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Programs (1)	Maximum Number of Shares That May Yet Be Purchased Under the Programs (1), (2)
July 2016				
Repurchase program	240,824	$ 105.91	240,824	7,109,273
August 2016				
Repurchase program	1,117,106	$ 105.02	1,117,106	5,922,421
September 2016				
Repurchase program	1,039,282	$ 103.09	1,039,282	5,030,023
Total quarter ended September 30, 2016				
Repurchase program	2,397,212	$ 104.28	2,397,212	5,030,023

(1) These shares were repurchased under a $2 billion share repurchase program approved in April 2014. The remaining shares that may be repurchased under the $2 billion repurchase program have been calculated based upon PPG's closing stock price on the last business day of the respective month. This repurchase program has no expiration date.

(2) On October 7, 2016, PPG's board of directors approved a $2 billion share repurchase program. 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: October 21, 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.

††12	Computation of Ratio of Earnings to Fixed Charges for the Nine Months Ended September 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 nine months ended September 30, 2016 and 2015, (ii) the Condensed Consolidated Balance Sheet at September 30, 2016 and December 31, 2015, (iii) the Condensed Consolidated Statement of Cash Flows for the nine months ended September 30, 2016 and 2015, and (iv) Notes to Condensed Consolidated Financial Statements for the three and nine months ended September 30, 2016.

Exhibit 12

PPG INDUSTRIES, INC. AND CONSOLIDATED SUBSIDIARIES
Computation of Ratio of Earnings to Fixed Charges
(Dollars in millions)

	Nine Months Ended September 30	Year Ended December 31				
	2016	2015	2014	2013	2012	2011
Earnings:						
Earnings before income taxes and net earnings in equity affiliates	$ 674	$ 1,766	$ 1,239	$ 1,207	$ 800	$ 927
Plus:						
Fixed charges exclusive of capitalized interest	163	211	278	282	279	278
Amortization of capitalized interest	4	6	5	5	5	5
Adjustments for equity affiliates	2	77	5	9	12	19
Total	**$ 843**	**$ 2,060**	**$ 1,527**	**$ 1,503**	**$ 1,096**	**$ 1,229**
Fixed Charges:						
Interest expense incl amortization of debt discount/premium and debt expense	$ 95	$ 124	$ 186	$ 195	$ 209	$ 209
Rentals - portion representative of interest	68	87	92	87	70	69
Fixed charges exclusive of capitalized interest	163	211	278	282	279	278
Capitalized interest	6	9	16	10	8	9
Total	**$ 169**	**$ 220**	**$ 294**	**$ 292**	**$ 287**	**$ 287**
Ratio of earnings to fixed charges	**5.0**	**9.4**	**5.2**	**5.1**	**3.8**	**4.3**

Note: The financial information of all prior periods has been reclassified to reflect discontinued operations

Exhibit 31.1

PRINCIPAL EXECUTIVE OFFICER CERTIFICATION

I, Michael H. McGarry, certify that:

1. I have reviewed this quarterly report on Form 10-Q of PPG Industries, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: October 21, 2016

/s/ Michael H. McGarry

Michael H. McGarry
Chairman and Chief Executive Officer

Exhibit 31.2

PRINCIPAL FINANCIAL OFFICER CERTIFICATION

I, Frank S. Sklarsky, certify that:

1. I have reviewed this quarterly report on Form 10-Q of PPG Industries, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: October 21, 2016

/s/ Frank S. Sklarsky

Frank S. Sklarsky
Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of PPG Industries, Inc. for the period ended September 30, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Michael H. McGarry, Chairman and Chief Executive Officer of PPG Industries, Inc., certify to the best of my knowledge, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of PPG Industries, Inc.

/s/ Michael H. McGarry

Michael H. McGarry
Chairman and Chief Executive Officer
October 21, 2016

A signed original of this written statement required by Section 906 has been provided to PPG Industries, Inc. and will be retained by PPG Industries, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of PPG Industries, Inc. for the period ended September 30, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Frank S. Sklarsky, Executive Vice President and Chief Financial Officer of PPG Industries, Inc., certify to the best of my knowledge, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of PPG Industries, Inc.

/s/ Frank S. Sklarsky

Frank S. Sklarsky
Executive Vice President and Chief Financial Officer
(Principal Financial and Accounting Officer)

October 21, 2016

A signed original of this written statement required by Section 906 has been provided to PPG Industries, Inc. and will be retained by PPG Industries, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.