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

FORM 10-Q

☑ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the quarterly period ended: September 30, 2019
or
☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from _____ to _____
Commission file number 1-1687

PPG INDUSTRIES INC.

(Exact name of registrant as specified in its charter)

25-0730780
(I.R.S. Employer Identification No.)
Pennsylvania
(State or Other Jurisdiction of Incorporation or Organization)
One PPG Place, Pittsburgh, Pennsylvania
(Address of Principal Executive Offices)
15272
(Zip Code)
(412) 434-3131
(Registrant's Telephone Number, Including Area Code)
Not Applicable
(Former Name, Former Address and Former Fiscal Year, if Changed Since Last Report)
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $1.66 2/3	PPG	New York Stock Exchange
0.000% Notes due 2019	PPG 19	New York Stock Exchange
0.875% Notes due 2022	PPG 22	New York Stock Exchange
0.875% Notes due 2025	PPG 25	New York Stock Exchange
1.400% Notes due 2027	PPG 27	New York Stock Exchange

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted 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 such files). Yes ☑ No ☐

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

Large Accelerated Filer	☑	Accelerated Filer	☐
Non-accelerated Filer	☐	Smaller Reporting Company	☐
		Emerging Growth Company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

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

As of September 30, 2019, 236,463,211 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	
	2019	2018	2019	2018
Net sales	$3,826	$3,817	$11,474	$11,729
Cost of sales, exclusive of depreciation and amortization	2,181	2,253	6,542	6,813
Selling, general and administrative	887	867	2,710	2,718
Depreciation	99	89	276	267
Amortization	34	33	101	103
Research and development, net	107	110	323	336
Interest expense	33	31	99	88
Interest income	(10)	(6)	(23)	(18)
Business restructuring, net	2	(12)	175	71
Other charges	26	25	69	72
Other income	(14)	(24)	(61)	(72)
Income before income taxes	$481	$451	$1,263	$1,351
Income tax expense	109	79	297	270
Income from continuing operations	$372	$372	$966	$1,081
Income from discontinued operations, net of tax	1	10	3	16
Net income attributable to controlling and noncontrolling interests	$373	$382	$969	$1,097
Less: Net income attributable to noncontrolling interests	(6)	(4)	(18)	(14)
Net income (attributable to PPG)	$367	$378	$951	$1,083
Amounts attributable to PPG:				
Income from continuing operations, net of tax	$366	$368	$948	$1,067
Income from discontinued operations, net of tax	1	10	3	16
Net income (attributable to PPG)	$367	$378	$951	$1,083
Earnings per common share:				
Income from continuing operations, net of tax	$1.55	$1.52	$4.00	$4.34
Income from discontinued operations, net of tax	—	0.04	0.01	0.07
Net income (attributable to PPG)	$1.55	$1.56	$4.01	$4.41
Earnings per common share – assuming dilution:				
Income from continuing operations, net of tax	$1.54	$1.51	$3.98	$4.32
Income from discontinued operations, net of tax	—	0.04	0.01	0.06
Net income (attributable to PPG)	$1.54	$1.55	$3.99	$4.38

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	
	2019	2018	2019	2018
Net income attributable to the controlling and noncontrolling interests	$373	$382	$969	$1,097
Other comprehensive (loss)/income, net of tax:				
Defined benefit pension and other postretirement benefits	(2)	(12)	4	20
Unrealized foreign currency translation adjustments	(103)	89	(37)	(62)
Derivative financial instruments	1	(2)	—	(2)
Other comprehensive (loss)/income, net of tax	($104)	$75	($33)	($44)
Total comprehensive income	$269	$457	$936	$1,053
Less: amounts attributable to noncontrolling interests:				
Net income	(6)	(4)	(18)	(14)
Unrealized foreign currency translation adjustments	6	3	5	11
Comprehensive income attributable to PPG	$269	$456	$923	$1,050

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, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$1,432	$902
Short-term investments	58	61
Receivables (less allowance for doubtful accounts of $27 and $24)	3,028	2,845
Inventories	1,860	1,783
Other current assets	439	370
Total current assets	$6,817	$5,961
Property, plant and equipment (net of accumulated depreciation of $3,964 and $3,828)	2,862	2,805
Goodwill	4,335	4,070
Identifiable intangible assets, net	2,083	1,972
Deferred income taxes	194	229
Investments	254	251
Operating lease right-of-use assets (Note 3)	742	—
Other assets	777	727
Total	$18,064	$16,015
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable and accrued liabilities	$3,636	$3,623
Restructuring reserves	141	99
Short-term debt and current portion of long-term debt	639	651
Current portion of operating lease liabilities (Note 3)	162	—
Total current liabilities	$4,578	$4,373
Long-term debt	4,885	4,365
Operating lease liabilities (Note 3)	588	—
Accrued pensions	627	645
Other postretirement benefits	616	629
Deferred income taxes	455	429
Other liabilities	960	842
Total liabilities	$12,709	$11,283
Commitments and contingent liabilities (Note 15)		
Shareholders' equity:		
Common stock	969	969
Additional paid-in capital	925	788
Retained earnings	18,735	18,131
Treasury stock, at cost	(13,054)	(12,958)
Accumulated other comprehensive loss	(2,328)	(2,300)
Total PPG shareholders' equity	$5,247	$4,630
Noncontrolling interests	108	102
Total shareholders' equity	$5,355	$4,732
Total	$18,064	$16,015

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 Shareholders' Equity (Unaudited)

($ in millions)

	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive (Loss)/Income	Total PPG	Non-controlling Interests	Total
January 1, 2019	$969	$788	$18,131	($12,958)	($2,300)	$4,630	$102	$4,732
Net income attributable to the controlling and noncontrolling interests	—	—	312	—	—	312	5	317
Other comprehensive income/(loss), net of tax	—	—	—	—	76	76	(1)	75
Cash dividends	—	—	(113)	—	—	(113)	—	(113)
Purchase of treasury stock	—	—	—	(175)	—	(175)	—	(175)
Issuance of treasury stock	—	121	—	63	—	184	—	184
Stock-based compensation activity	—	(10)	—	—	—	(10)	—	(10)
March 31, 2019	$969	$899	$18,330	($13,070)	($2,224)	$4,904	$106	$5,010
Net income attributable to the controlling and noncontrolling interests	—	—	272	—	—	272	7	279
Other comprehensive (loss)/income, net of tax	—	—	—	—	(6)	(6)	2	(4)
Cash dividends	—	—	(114)	—	—	(114)	—	(114)
Issuance of treasury stock	—	7	—	9	—	16	—	16
Stock-based compensation activity	—	7	—	—	—	7	—	7
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(5)	(5)
Reductions in noncontrolling interests	—	—	—	—	—	—	(2)	(2)
June 30, 2019	$969	$913	$18,488	($13,061)	($2,230)	$5,079	$108	$5,187
Net income attributable to the controlling and noncontrolling interests	—	—	367	—	—	367	6	373
Other comprehensive loss, net of tax	—	—	—	—	(98)	(98)	(6)	(104)
Cash dividends	—	—	(120)	—	—	(120)	—	(120)
Issuance of treasury stock	—	5	—	7	—	12	—	12
Stock-based compensation activity	—	7	—	—	—	7	—	7
September 30, 2019	$969	$925	$18,735	($13,054)	($2,328)	$5,247	$108	$5,355

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 Shareholders' Equity (Unaudited)
($ in millions)

	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive (Loss)/Income	Total PPG	Non-controlling Interests	Total
January 1, 2018	$969	$756	$17,140	($11,251)	($2,057)	$5,557	$115	$5,672
Net income attributable to the controlling and noncontrolling interests	—	—	334	—	—	$334	6	$340
Other comprehensive income, net of tax	—	—	—	—	159	$159	2	$161
Cash dividends	—	—	(112)	—	—	($112)	—	($112)
Purchase of treasury stock	—	—	—	(600)	—	($600)	—	($600)
Issuance of treasury stock	—	24	—	7	—	$31	—	$31
Stock-based compensation activity	—	(19)	—	—	—	($19)	—	($19)
Reductions in noncontrolling interests	—	—	—	—	—	$—	(2)	($2)
Reclassification from other comprehensive income to retained earnings - Adoption of ASU 2018-02	—	—	107	—	(107)	$—	—	$—
Adjustment to retained earnings - Adoption of ASU 2016-16	—	—	(4)	—	—	($4)	—	($4)
March 31, 2018	$969	$761	$17,465	($11,844)	($2,005)	$5,346	$121	$5,467
Net income attributable to the controlling and noncontrolling interests	—	—	371	—	—	371	4	375
Other comprehensive loss, net of tax	—	—	—	—	(270)	(270)	(10)	(280)
Cash dividends	—	—	(110)	—	—	(110)	—	(110)
Purchase of treasury stock	—	—	—	(463)	—	(463)	—	(463)
Issuance of treasury stock	—	1	—	2	—	3	—	3
Stock-based compensation activity	—	7	—	—	—	7	—	7
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(2)	(2)
Reductions in noncontrolling interests	—	—	—	—	—	—	(14)	(14)
June 30, 2018	$969	$769	$17,726	($12,305)	($2,275)	$4,884	$99	$4,983
Net income attributable to the controlling and noncontrolling interests	—	—	378	—	—	378	4	382
Other comprehensive income/(loss), net of tax	—	—	—	—	78	78	(3)	75
Cash dividends	—	—	(116)	—	—	(116)	—	(116)
Purchase of treasury stock	—	—	—	(250)	—	(250)	—	(250)
Issuance of treasury stock	—	1	—	3	—	4	—	4
Stock-based compensation activity	—	2	—	—	—	2	—	2
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(2)	(2)
September 30, 2018	$969	$772	$17,988	($12,552)	($2,197)	$4,980	$98	$5,078

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 2019	2018
Operating activities:		
Net income attributable to controlling and noncontrolling interests	$969	$1,097
Less: Income from discontinued operations	(3)	(16)
Income from continuing operations	$966	$1,081
Adjustments to reconcile net income to cash from operations:		
Depreciation and amortization	377	370
Pension expense	38	30
Environmental remediation charges, net	61	34
Business restructuring, net	175	71
Impairment of a non-manufacturing asset	—	9
Stock-based compensation expense	28	21
Equity affiliate loss, net of dividends	4	3
Deferred income tax benefit	(26)	(5)
Cash contributions to pension plans	(8)	(89)
Cash used for restructuring actions	(35)	(48)
Change in certain asset and liability accounts:		
Receivables	(188)	(419)
Inventories	(49)	(285)
Other current assets	(70)	(5)
Accounts payable and accrued liabilities	35	102
Taxes and interest payable	59	51
Noncurrent assets and liabilities, net	(52)	(144)
Other	(40)	(90)
Cash from operating activities - continuing operations	$1,275	$687
Cash used for operating activities - discontinued operations	(4)	(20)
Cash from operating activities	$1,271	$667
Investing activities:		
Capital expenditures	(224)	(226)
Business acquisitions, net of cash balances acquired	(564)	(98)
Payments for the settlement of cross currency swap contracts	(8)	(23)
Proceeds from the settlement of cross currency swap	26	20
Other	22	16
Cash used for investing activities	($748)	($311)
Financing activities:		
Net change in borrowing with maturities of three months or less	6	5
Net payments on commercial paper and short-term debt	—	(1)
Proceeds from the issuance of debt, net of discounts and fees	595	992
Repayment of long-term debt	(3)	(5)
Repayment of acquired debt	(23)	—
Purchase of treasury stock	(175)	(1,313)
Issuance of treasury stock	32	14
Dividends paid	(347)	(338)
Payments related to tax withholding on stock-based compensation awards	(15)	(14)
Other	(29)	(10)
Cash from/(used for) financing activities	$41	($670)
Effect of currency exchange rate changes on cash and cash equivalents	(34)	(19)
Net increase/(decrease) in cash and cash equivalents	$530	($333)
Cash and cash equivalents, beginning of period	902	1,436

Cash and cash equivalents, end of period	$1,432	$1,103
Supplemental disclosures of cash flow information:		
Interest paid, net of amount capitalized	$93	$68
Taxes paid, net of refunds	$282	$320
Supplemental disclosure of noncash investing activities:		
Reissuance of common stock for business acquisition	$164	$—

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 (the "SEC") 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 and shareholders' equity of PPG as of September 30, 2019, and the results of its operations and cash flows for the three and nine months ended September 30, 2019 and 2018. 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 2018 Annual Report on Form 10-K (the "2018 Form 10-K").

Net sales, 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, 2019 and the trends in these unaudited condensed consolidated financial statements may not necessarily be indicative of the results to be expected for the full year.

2. New Accounting Standards

Accounting Standards Adopted in 2019

Effective January 1, 2019, PPG adopted Accounting Standards Update (“ASU”) No. 2016-02, "Leases." This ASU requires substantially all leases be recorded on the balance sheet as right of use assets and lease obligations. PPG adopted the ASU using a retrospective adoption method at January 1, 2019, as outlined in ASU No. 2018-11, "Leases - Targeted Improvements." Under this method of adoption, there is no impact to the comparative condensed consolidated statement of income and condensed consolidated balance sheet. PPG determined that there was no cumulative-effect adjustment to beginning Retained earnings on the condensed consolidated balance sheet. PPG will continue to report periods prior to January 1, 2019 in its financial statements under prior guidance as outlined in Accounting Standards Codification Topic 840, "Leases." In addition, PPG elected the package of practical expedients permitted under the transition guidance within the new standard, which among other things, allowed carry forward of historical lease classifications.

Adoption of this standard did not materially impact PPG’s Income before income taxes and had no impact on the condensed consolidated statement of cash flows. See Note 3, "Leases" for further details.

Accounting Standards to be Adopted in Future Years

In August 2018, the Financial Accounting Standards Board ("FASB") issued ASU No. 2018-15, "Intangibles - Goodwill and Other - Internal-Use Software." This ASU requires capitalization of certain implementation costs incurred in a cloud computing arrangement that is a service contract. The amendments in this ASU are effective for fiscal years beginning after December 15, 2019 and for interim periods therein with early adoption permitted. PPG does not believe this ASU will have a material impact on its consolidated financial position, results of operations or 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. Entities may choose to adopt the new ASU as of its fiscal year beginning after December 15, 2018. PPG did not early adopt this standard. PPG does not believe this ASU will have a material impact on its consolidated financial position, results of operations or cash flows.

3. Leases

PPG leases certain retail paint stores, warehouses, distribution facilities, office space and equipment, including fleet vehicles. PPG determines if a contract is a lease at the inception of the arrangement. PPG reviews all options to extend, terminate, or purchase its right of use assets at the inception of the lease and accounts for these options when they are reasonably certain of being exercised. Certain real estate leases contain lease and non-lease components,

which are accounted for separately. For certain equipment leases, lease and non-lease components are accounted for as a single lease component.

Leases with an initial term of 12 months or less are not recorded on the condensed consolidated balance sheet. Lease expense for these leases is recognized on a straight-line basis over the lease term.

The components of lease expense were as follows:

($ in millions)	Classification in the Condensed Consolidated Statement of Income	Three Months Ended September 30, 2019	Nine Months Ended September 30, 2019
Operating lease cost	Cost of sales, exclusive of depreciation and amortization	$8	$26
Operating lease cost	Selling, general and administrative	50	147
Total operating lease cost		$58	$173
Finance lease cost:			
Amortization of right-of-use assets	Depreciation	$1	$2
Interest on lease liabilities	Interest Expense	—	1
Total finance lease cost		$1	$3
Total lease cost		$59	$176

Total operating lease cost is inclusive of the following:

($ in millions)	Three Months Ended September 30, 2019	Nine Months Ended September 30, 2019
Variable lease costs	$3	$10
Short-term lease costs	$1	$4

Variable lease expense is based on contractual arrangements with PPG's lessors determined based on external indices or other relevant market factors. In addition, PPG's variable lease expense also includes elements of a contract that do not represent a good or service but for which the lessee is responsible for paying.

($ in millions)	Classification on the Condensed Consolidated Balance Sheet	September 30, 2019
Assets:		
Operating	Operating lease right-of-use assets	$742
Finance [(a)]	Property, plant, and equipment	19
Total leased assets		$761
Liabilities:		
Current		
Operating	Current portion of operating lease liabilities	$162
Finance	Short-term debt and current portion of long-term debt	3
Noncurrent		
Operating	Operating lease liabilities	588
Finance	Long-term debt	8
Total lease liabilities		$761

(a) Net of accumulated depreciation of $11 million.

($ in millions)	Nine Months Ended September 30, 2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$157
Operating cash flows from finance leases	$—
Financing cash flows from finance leases	$3
Right-of-use assets obtained in exchange for lease obligations:	
Operating leases	$145
Finance leases	$1

	As of September 30, 2019
Weighted-average remaining lease term (in years)	
Operating leases	7.5
Finance leases	6.3
Weighted-average discount rate	
Operating leases	3.1%
Finance leases	9.3%

Nearly all of PPG's lease contracts do not provide a readily determinable implicit rate. For these contracts, PPG's estimated incremental borrowing rate is based on information available at the inception of the lease.

As of September 30, 2019, maturities of lease liabilities were as follows:

($ in millions)	Operating Leases	Finance Leases
Remaining three months of 2019	$50	$1
2020	173	3
2021	134	2
2022	105	2
2023	82	1
Thereafter	303	4
Total lease payments	$847	$13
Less: Interest	97	2
Total lease obligations	$750	$11

Disclosures related to periods prior to adoption of ASU 2016-02

PPG adopted ASU 2016-02 using a retrospective adoption method at January 1, 2019 as noted in Note 2, "New Accounting Standards." As required, the following disclosure is provided for periods prior to adoption. Minimum lease commitments as of December 31, 2018 that have initial or remaining lease terms in excess of one year are as follows:

($ in millions)	Operating Leases	Capital Leases
2019	$207	$3
2020	157	3
2021	116	1
2022	93	1
2023	76	1
Beyond 2023	$244	$3

4. Acquisitions and Divestitures

Acquisitions

On August 14, 2019, PPG completed the acquisition of Dexmet Corporation, a specialty materials manufacturer. Headquartered in Wallingford, Connecticut, Dexmet Corporation specializes in customized, highly-engineered, expanded and perforated metal foils and polymers used for structural applications. 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. The results of this business since the date of acquisition have been reported within the aerospace coatings business within the Performance Coatings reportable segment.

On April 16, 2019, PPG completed the acquisition of Hemmelrath, an automotive coatings manufacturer. Headquartered in Klingenberg, Germany, Hemmelrath is a global manufacturer of coatings for automotive original equipment manufacturers ("OEMs"). 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. The results of this business since the date of acquisition have been reported within the automotive OEM coatings business within the Industrial Coatings reportable segment.

On March 1, 2019, PPG completed the acquisition of Whitford Worldwide Company ("Whitford"), a global manufacturer that specializes in low-friction and nonstick coatings for industrial applications and consumer products. Whitford employs more than 700 people and operates 10 manufacturing facilities globally. 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. The results of this business since the date of acquisition have been reported within the industrial coatings business within the Industrial Coatings reportable segment.

In January 2018, PPG acquired ProCoatings, a leading architectural paint and coatings wholesaler located in The Netherlands. ProCoatings, established in 2001, distributes a large portfolio of well-known professional paint brands through its network of 23 multi-brand stores. The company employs nearly 100 people. 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.The results of this business since the date of acquisition have been reported within the architectural coatings - Europe, Middle East and Africa (EMEA) business within the Performance Coatings reportable segment.

Divestitures

Glass Segment

Income from discontinued operations, net of tax related to the former Glass reportable business segment for the three and nine months ended September 30, 2018 were as follows:

($ in millions)	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2018
Income from operations	$13	$21
Income tax expense	3	5
Income from discontinued operations, net of tax	$10	$16

During the third quarter of 2018, PPG released $13 million of previously recorded accruals and contingencies established in conjunction with the divestitures of businesses within the former Glass segment as a result of completed actions, new information and updated estimates. Also in the third quarter of 2018, PPG made a final payment of $20 million to Vitro S.A.B. de C.V related to the transfer of certain pension obligations upon the sale of the former flat glass business.

5. Inventories

($ in millions)	September 30, 2019	December 31, 2018
Finished products	$1,159	$1,105
Work in process	207	193
Raw materials	460	452
Supplies	34	33
Total Inventories	$1,860	$1,783

Most U.S. inventories are valued using the last-in, first-out method. These inventories represented approximately 34% and 36% of total inventories at September 30, 2019 and December 31, 2018, respectively. If the first-in, first-out method of inventory valuation had been used, inventories would have been $127 million and $113 million higher as of September 30, 2019 and December 31, 2018, respectively.

6. 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, 2019 was as follows:

($ in millions)	Performance Coatings	Industrial Coatings	Total
January 1, 2019	$3,266	$804	$4,070
Acquisitions, including purchase accounting adjustments	130	229	359
Foreign currency impact	(71)	(23)	(94)
September 30, 2019	$3,325	$1,010	$4,335

A summary of the carrying value of the Company's identifiable intangible assets is as follows:

	September 30, 2019			December 31, 2018		
($ in millions)	Gross Carrying Amount	Accumulated Amortization	Net	Gross Carrying Amount	Accumulated Amortization	Net
Indefinite-Lived Identifiable Intangible Assets						
Trademarks	$1,131	N/A	$1,131	$1,140	N/A	$1,140
Definite-Lived Identifiable Intangible Assets						
Acquired technology	$694	($536)	$158	$648	($515)	$133
Customer-related	1,525	(840)	685	1,396	(798)	598
Trade names	204	(105)	99	190	(96)	94
Other	49	(39)	10	44	(37)	7
Total Definite Lived Intangible Assets	$2,472	($1,520)	$952	$2,278	($1,446)	$832
Total Identifiable Intangible Assets	$3,603	($1,520)	$2,083	$3,418	($1,446)	$1,972

The Company’s identifiable intangible assets with finite lives are being amortized over their estimated useful lives.

As of September 30, 2019, estimated future amortization expense of identifiable intangible assets is as follows:

($ in millions)	Future Amortization Expense
Remaining three months of 2019	$24
2020	115
2021	110
2022	95
2023	90
2024	75
Thereafter	443

7. 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 certain other cash costs.

2019 Restructuring Program

In June 2019, the Company approved a business restructuring plan which included actions to reduce its global cost structure. The program is the result of a comprehensive internal operational assessment to identify further opportunities to improve the profitability of the overall business portfolio. This program includes further manufacturing optimization; targeted pruning of low-profit business in certain regions; exiting certain smaller product lines that are not meeting profitability objectives; reorganization of certain business unit cost structures based on the current economic climate; and certain redundancy actions related to recent acquisitions.

A pretax restructuring charge of $184 million was recorded in PPG's second quarter financial results. In the third quarter of 2019, additional programs were approved by management and charges of $10 million were recorded in PPG's

financial results. These charges represent employee severance and certain other cash costs. The majority of restructuring actions are expected to be completed by the end of the fourth quarter 2020 with the remainder of the actions expected to be completed in 2022.

2018 Restructuring Program

In April 2018, the Company approved a business restructuring plan which included actions to reduce its global cost structure. The program was in response to the impacts of customer assortment changes in our U.S. architectural coatings business during the first quarter 2018 and sustained, elevated raw material inflation. The program aims to further right-size employee headcount and production capacity in certain businesses based on product demand, as well as reductions in various global functional and administrative costs. Substantially all actions from this business restructuring plan are expected to be complete by the end of the first quarter of 2020.

2016 Restructuring Program

In December 2016, PPG's Board of Directors approved a business restructuring program which includes actions necessary to reduce the Company's global cost structure. The program is focused on certain regions and end-use markets where business conditions were the weakest, as well as reductions in production capacity and various global functional and administrative costs. Substantially all actions from this business restructuring plan have been completed.

The following table summarizes the reserve activity for the nine months ended September 30, 2019:

($ in millions)	Total Reserve
December 31, 2018	$110
2019 restructuring charges	194
Cash payments	(35)
Release of prior reserves and other adjustments	(19)
Foreign currency impact	(8)
September 30, 2019	$242

In 2019, adjustments of $19 million were recorded to reduce the remaining restructuring reserves established under previously approved programs to reflect the current estimate of the costs to complete these actions.

8. Borrowings

On August 30, 2019, PPG amended and restated its five-year credit agreement (the "Credit Agreement") with several banks and financial institutions. The Credit Agreement amends and restates the Company's existing five year credit agreement dated as of December 18, 2015. The Credit Agreement provides for a $2.2 billion unsecured revolving credit facility. The Company has the ability to increase the size of the Credit Agreement by up to an additional $750 million, subject to the receipt of lender commitments and other conditions precedent. The Credit Agreement will terminate on August 30, 2024. The Company has the right, subject to certain conditions set forth in the Credit Agreement, to designate certain subsidiaries of the Company as borrowers under the Credit Agreement. In connection with any such designation, the Company is required to guarantee the obligations of any such subsidiaries under the Credit Agreement. As of September 30, 2019 and December 31, 2018, there were no amounts outstanding under the existing or prior credit agreement.

Borrowings under the Credit Agreement may be made in U.S. Dollars or in Euros. The Credit Agreement provides that loans will bear interest at rates based, at the Company's option, on one of two specified base rates plus a margin based on certain formulas defined in the Credit Agreement. Additionally, the Credit Agreement contains a Commitment Fee, as defined in the Credit Agreement, on the amount of unused commitments under the Credit Agreement ranging from 0.060% to 0.125% per annum.

The Credit Agreement also supports the Company's commercial paper borrowings. There were no commercial paper borrowings outstanding as of September 30, 2019 and December 31, 2018.

The Credit Agreement contains usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Credit Agreement also requires the Company to maintain a ratio of Total Indebtedness to Total Capitalization, as defined in the Credit Agreement, of 60% or less; provided, that for any fiscal quarter in which the Company has made an acquisition for consideration in excess of $1 billion and for the next five fiscal quarters thereafter, the ratio of Total

Indebtedness to Total Capitalization may not exceed 65% at any time. As of September 30, 2019, Total Indebtedness to Total Capitalization as defined under the Credit Agreement was 49%.

The Credit Agreement contains, among other things, customary events of default that would permit the lenders to accelerate the loans, including the failure to make timely payments when due under the Credit Agreement or other material indebtedness, the failure to satisfy covenants contained in the Credit Agreement, a change in control of the Company and specified events of bankruptcy and insolvency.

On August 15, 2019, PPG completed a public offering of $300 million aggregate principal amount of 2.4% notes due 2024 and $300 million aggregate principal amount of 2.8% notes due 2029. These notes were issued pursuant to PPG's existing shelf registration statement and pursuant to an indenture between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee, as supplemented (the "Indenture"). The Indenture governing these notes contains covenants that limit the Company's ability to, among other things, incur certain liens securing indebtedness, engage in certain sale-leaseback transactions, and enter into certain consolidations, mergers, conveyances, transfers or leases of all or substantially all the Company's assets. The terms of these notes also require the Company to make an offer to repurchase notes upon a Change of Control Triggering Event (as defined in the Indenture) at a price equal to 101% of their principal amount plus accrued and unpaid interest. The Company may issue additional debt from time to time pursuant to the Indenture. The aggregate cash proceeds from the notes, net of discounts and fees, was $595 million.

In February 2018, PPG completed a public offering of $300 million aggregate principal amount of 3.2% notes due 2023 and $700 million aggregate principal amount of 3.75% notes due 2028. These notes were issued pursuant to PPG's existing shelf registration statement and pursuant to the Indenture. The Indenture governing these notes contains covenants that limit the Company's ability to, among other things, incur certain liens securing indebtedness, engage in certain sale-leaseback transactions, and enter into certain consolidations, mergers, conveyances, transfers or leases of all or substantially all the Company's assets. The terms of these notes also require the Company to make an offer to repurchase notes upon a Change of Control Triggering Event (as defined in the Indenture) at a price equal to 101% of their principal amount plus accrued and unpaid interest. The Company may issue additional debt from time to time pursuant to the Indenture. The aggregate cash proceeds from the notes, net of discounts and fees, was $992 million. A portion of the notes were converted from a fixed interest rate to a floating interest rate using interest rate swap contracts. For more information, refer to Note 13, "Financial Instruments, Hedging Activities and Fair Value Measurements."

9. Earnings Per Common 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, 2019 and 2018 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
(number of shares in millions)	2019	2018	2019	2018
Weighted average common shares outstanding	237.1	242.2	236.9	245.8
Effect of dilutive securities:				
Stock options	0.7	0.7	0.6	0.8
Other stock compensation plans	0.7	0.7	0.7	0.7
Potentially dilutive common shares	1.4	1.4	1.3	1.5
Adjusted weighted average common shares outstanding	238.5	243.6	238.2	247.3
Dividends per common share	$0.51	$0.48	$1.47	$1.38

Excluded from the computation of earnings per diluted share due to their antidilutive effect were 1.0 million outstanding stock options for the three and nine months ended September 30, 2019 and 2018.

10. Income Taxes

	Nine Months Ended September 30	
	2019	2018
Effective tax rate on pretax income from continuing operations	23.5%	20.0%

The effective tax rate of 23.5% for the nine months ended September 30, 2019 reflects a benefit of $23 million of discrete items associated with PPG's U.S. and foreign jurisdictions. For the nine months ended September 30, 2018, the effective tax rate was 20.0% inclusive of a $38 million benefit for discrete items related to U.S. income tax reform. Income tax expense for the first nine months of 2019 is based on an estimated annual effective rate, which requires management to make its best estimate of annual pretax income or loss.

During the year, PPG management regularly updates forecasted annual pretax results for the various countries in which PPG operates based on changes in factors such as prices, shipments, product mix, raw material inflation and manufacturing operations. To the extent that actual 2019 pretax results for U.S. and foreign income or loss vary from estimates, the actual Income tax expense recognized in 2019 could be different from the forecasted amount used to estimate the Income tax expense for the nine months ended September 30, 2019.

11. Pensions and Other Postretirement Benefits

Service cost for net periodic pension and other postretirement benefit costs is included in Cost of sales, exclusive of depreciation and amortization, Selling, general and administrative, and Research and development, net in the accompanying condensed consolidated statements of income. All other components of net periodic benefit cost are now recorded in Other charges, except for pension settlement charges, in the accompanying condensed consolidated statements of income.

The net periodic pension and other postretirement benefit costs for the three and nine months ended September 30, 2019 and 2018 were as follows:

	Pension			
	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2019	2018	2019	2018
Service cost	$6	$8	$17	$24
Interest cost	26	23	79	71
Expected return on plan assets	(35)	(37)	(105)	(113)
Amortization of actuarial losses	16	16	47	48
Net periodic benefit cost	$13	$10	$38	$30

	Other Postretirement Benefits			
	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2019	2018	2019	2018
Service cost	$3	$2	$7	$7
Interest cost	6	6	19	18
Amortization of actuarial losses	2	5	6	14
Amortization of prior service credit	(14)	(15)	(43)	(45)
Net periodic benefit cost	($3)	($2)	($11)	($6)

PPG expects its 2019 net periodic pension and other postretirement benefit cost will be approximately $35 million, with pension expense representing approximately $50 million and other postretirement benefit cost representing a benefit of approximately $15 million.

Contributions to Defined Benefit Pension Plans

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2019	2018	2019	2018
U.S. defined benefit pension contributions	$—	$50	$—	$75
Non-U.S. defined benefit pension mandatory contributions	$2	$4	$8	$14

PPG made voluntary contributions of $50 million and $25 million its U.S. defined benefit pension plans in September 2018 and January 2018, respectively. PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of $5 million to $10 million during the remaining three months of 2019. PPG may make voluntary contributions to its defined benefit pension plans in 2019 and beyond.

12. Accumulated Other Comprehensive Loss

($ in millions)	Unrealized Foreign Currency Translation Adjustments	Pension and Other Postretirement Benefit Adjustments, net of tax (c)	Unrealized Gain/(Loss) on Derivatives, net of tax (d)	Accumulated Other Comprehensive Loss
January 1, 2019	($1,734)	($568)	$2	($2,300)
Current year deferrals to AOCI (a)	(151)	—	—	(151)
Current year deferrals to AOCI, net of tax (b)	119	(6)	(3)	110
Reclassifications from AOCI to net income	—	10	3	13
Period change	($32)	$4	$—	($28)
September 30, 2019	($1,766)	($564)	$2	($2,328)
January 1, 2018	($1,567)	($493)	$3	($2,057)
Current year deferrals to AOCI	(172)	—	—	(172)
Current year deferrals to AOCI, net of tax (b)	121	6	(6)	121
Reclassifications from AOCI to net income	—	14	4	18
Period change	($51)	$20	($2)	($33)
Reclassification from AOCI to Retained earnings - Adoption ASU 2018-02	(23)	(84)	—	(107)
September 30, 2018	($1,641)	($557)	$1	($2,197)

(a) Except for income taxes of $6 million related to foreign currency impacts of certain unasserted earnings, unrealized foreign currency translation adjustments related to translation of foreign denominated balance sheets are not presented net of tax given that no deferred U.S. income taxes have been provided on undistributed earnings of non-U.S. subsidiaries because they are deemed to be reinvested for an indefinite period of time.

(b) The tax cost related to unrealized foreign currency translation adjustments on tax inter-branch transactions and net investment hedges for the nine months ended September 30, 2019 and 2018 was $39 million and $29 million, respectively.

(c) The tax cost/(benefit) related to the adjustment for pension and other postretirement benefits for the nine months ended September 30, 2019 and 2018 was $2 million and ($3) million, respectively. Reclassifications from AOCI are included in the computation of net periodic benefit costs (See Note 11, "Pensions and Other Postretirement Benefits").

(d) The tax benefit related to the changes in the unrealized loss on derivatives for the nine months ended September 30, 2019 and 2018 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, 2019 and December 31, 2018, 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. As a result, financial instruments, including derivatives, have been used to hedge these underlying economic exposures. Certain of these instruments qualify as fair value, cash flow, 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 before income taxes 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, 2019 and 2018.

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, if the Company would be acquired and its payment obligations under its derivative instruments' contractual arrangements are not assumed by the acquirer, or if PPG would enter into bankruptcy, receivership or reorganization proceedings, its outstanding derivative 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, 2019 and 2018 and there were no gains or losses deferred in Accumulated other comprehensive loss on the condensed consolidated balance sheet that were reclassified to Income before income taxes in the condensed consolidated statement of income in the nine month periods ended September 30, 2019 and 2018 related to hedges of anticipated transactions that were no longer expected to occur.

Fair Value Hedges

The Company uses interest rate swaps from time to time to manage it's exposure to changing interest rates. When outstanding, the interest rate swaps are typically designated as fair value hedges of certain outstanding debt obligations of the Company and are recorded at fair value.

In February of 2018, PPG entered into interest rate swaps which converted $525 million of fixed rate debt to variable rate debt. The swaps are designated as fair value hedges and are carried at fair value. Changes in the fair value of these swaps and changes in the fair value of the related debt are recorded in Interest expense in the accompanying condensed consolidated statement of income.

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 third party transactions denominated in foreign currencies. Underlying notional amounts related to these foreign currency forward contracts were $24 million at September 30, 2019 and $50 million at December 31, 2018, respectively.

Net Investment Hedges

PPG uses cross currency swaps and foreign currency euro-denominated debt to hedge a significant portion of its net investment in its European operations, as follows:

In August of 2019, PPG entered into U.S. dollar to euro cross currency swap contracts with a total notional amount of $300 million and designated these contracts as hedges of the Company's net investment in its European operations. During the term of these contracts, PPG will receive payments in U.S. dollars and make payments in euros to the counterparties.

In February 2018, PPG entered into U.S. dollar to euro cross currency swap contracts with a total notional amount of $575 million and designated these contracts as hedges of the Company's net investment in its European operations. During the term of these contracts, PPG will receive payments in U.S. dollars and make payments in euros to the counterparties. Also in February 2018, the Company settled outstanding U.S. dollar to euro cross currency swap contracts with a total notional amount of $560 million.

As of September 30, 2019 and December 31, 2018, PPG had designated €2.3 billion of 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, 2019 and December 31, 2018 was $2.5 billion and $2.6 billion, respectively.

Other Financial Instruments

PPG uses foreign currency forward contracts to manage net transaction exposures that do not qualify for hedge accounting; therefore, the change in the fair value of these instruments is recorded in Other charges in the condensed

consolidated statement of income in the period of change. Underlying notional amounts related to these foreign currency forward contracts were $2.4 billion and $2.5 billion at September 30, 2019 and December 31, 2018, respectively.

Gains/Losses Deferred in Accumulated Other Comprehensive Loss

As of September 30, 2019, the Company had accumulated pretax unrealized translation gains in Accumulated other comprehensive loss on the condensed consolidated balance sheet related to the euro-denominated borrowings, foreign currency forward contracts and the cross currency swaps of $325 million. As of December 31, 2018, the Company had accumulated pretax unrealized translation gains of $161 million.

The following table summarizes the location within the condensed consolidated financial statements and amount of gains (losses) related to derivative financial instruments activity for the nine months ended September 30, 2019 and 2018. All dollar amounts are shown on a pretax basis.

	September 30, 2019		September 30, 2018		
($ in millions)	(Loss)/ Gain Deferred in OCI	Gain/(Loss) Recognized	Gain Deferred in OCI	Gain/(Loss) Recognized	Caption In Condensed Consolidated Statement of Income
Economic					
Foreign currency forward contracts	$—	$44	$—	$37	Other charges
Fair Value					
Interest rate swaps	—	2	—	3	Interest expense
Cash Flow					
Foreign currency forward contracts[1]	(4)	4	7	(5)	Other charges and Cost of sales
Total Cash Flow	($4)	$50	$7	$35	
Net Investment					
Cross currency swaps	$34	$12	$7	$8	Interest expense
Foreign denominated debt	130	—	92	—	
Total Net Investment	$164	$12	$99	$8	

(1) For the period ended September 30, 2019, the amounts excluded from effectiveness testing recognized in earnings based on an amortized approach was expense of $2 million.

Fair Value Measurements

The Company follows a fair value measurement hierarchy to measure its assets and liabilities. As of September 30, 2019 and December 31, 2018, 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 Note 13, "Employee Benefit Plans" under Item 8 in the 2018 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 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, 2019 and December 31, 2018 that are classified as Level 3 inputs.

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

($ in millions)	September 30, 2019			December 31, 2018		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Assets:						
Other current assets:						
Marketable equity securities	$4	$—	$—	$4	$—	$—
Foreign currency forward contracts [a]	—	50	—	—	45	—
Investments:						
Marketable equity securities	77	—	—	69	—	—
Other assets:						
Cross currency swaps [b]	—	70	—	—	35	—
Interest rate swaps [c]	—	47	—	—	8	—
Liabilities:						
Accounts payable and accrued liabilities:						
Foreign currency forward contracts [d]	—	—	—	—	1	—
Foreign currency forward contracts [a]	—	5	—	—	9	—
Other liabilities:						
Foreign currency forward contracts [b]	—	1	—	—	—	—

(a) Derivatives not designated as hedging instruments

(b) Net investment hedges

(c) Fair value hedges

(d) Cash flow hedges

Long-Term Debt

($ in millions)	September 30, 2019 [a]	December 31, 2018 [b]
Long-term debt - carrying value	$5,504	$5,000
Long-term debt - fair value	$5,882	$5,101

(a) Excluding finance lease obligations of $11 million and short term borrowings of $9 million as of September 30, 2019.

(b) Excluding capital lease obligations of $12 million and short term borrowings of $4 million as of December 31, 2018.

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.

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 ("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 7.0 million as of September 30, 2019.

Stock-based compensation and the income tax benefit recognized during the three and nine months ended September 30, 2019 and 2018 were as follows:

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2019	2018	2019	2018
Stock-based compensation	$9	$3	$28	$21
Income tax benefit recognized	$2	$1	$6	$5

Grants of stock-based compensation during the nine months ended September 30, 2019 and 2018 were as follows:

	Nine Months Ended September 30			
	2019		2018	
Grant Details	Shares	Fair Value	Shares	Fair Value
Stock options	588,870	$22.50	532,705	$25.27
Restricted stock units	233,306	$104.69	249,062	$107.23
Contingent shares (a)	51,850	$109.74	52,450	$115.64

(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 during the nine months ended September 30, 2019 was calculated with the following weighted average assumptions:

Weighted average exercise price	$109.74
Risk-free interest rate	2.6%
Expected life of option in years	6.5
Expected dividend yield	1.6%
Expected volatility	20.0%

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.

The amount paid upon vesting of performance-based RSUs may range from 0% to 180% of the original grant, based upon the frequency with which the annual earnings per share growth and cash flow return on capital performance targets are met over the three calendar year periods comprising the vesting period.

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 at the Company's discretion. 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, employment 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 with respect to some of the asbestos claims if the settlement is not implemented. 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 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.

Shareholder Class Action

On May 20, 2018, a putative securities class action lawsuit was filed in the U.S. District Court for the Central District of California against the Company and three of its current and former officers. On September 21, 2018, an Amended Class Action Complaint was filed in the lawsuit. The Amended Complaint, captioned Trevor Mild v. PPG Industries, Inc., Michael H. McGarry, Vincent J. Morales, and Mark C. Kelly, asserts securities fraud claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 on behalf of a putative class of persons who purchased or otherwise acquired stock of the Company between January 19, 2017 and May 10, 2018. The allegations relate to, among other things, allegedly false and misleading statements and/or failures to disclose information about the Company's business, operations and prospects. The parties reached a settlement in principal on May 1, 2019. On June 2, 2019, the plaintiff filed with the Court a Petition for Preliminary Approval of the proposed settlement, including the proposed settlement amount of $25 million. On July 25, 2019, the Court granted preliminary approval of the settlement, and now the parties are proceeding with the remaining procedures required to obtain final approval. The Court has scheduled October 21, 2019 for a hearing to consider the plaintiff's request for final approval of the settlement. PPG's insurance carriers confirmed to the Company insurance coverage for the full amount of the proposed settlement.

As of September 30, 2019, PPG recorded an accrued liability of $25 million for the proposed settlement amount and a corresponding asset for the insurance coverage of $25 million within Accounts payable and accrued liabilities and Other current assets, respectively.

Asbestos Matters

Prior to 2000, the Company had been named as a defendant in numerous claims alleging bodily injury from (i) exposure to asbestos-containing products allegedly manufactured, sold or distributed by the Company, its subsidiaries, or for which they are otherwise alleged to be liable; (ii) exposure to asbestos allegedly present at a facility owned or leased by the Company; or (iii) exposure to asbestos-containing products of Pittsburgh Corning Corporation ("PC") for which the Company was alleged to be liable under a variety of legal theories (the Company and Corning Incorporated were each 50% shareholders in PC).

Pittsburgh Corning Corporation asbestos bankruptcy

In 2000, PC filed for Chapter 11 in the U.S. Bankruptcy Court for the Western District of Pennsylvania in an effort to permanently and comprehensively resolve all of its pending and future asbestos-related liability claims. At the time of the bankruptcy filing, the Company had been named as one of many defendants in approximately 114,000 open claims. The Bankruptcy Court subsequently entered a series of orders preliminarily 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 preliminary injunction staying asbestos litigation against PPG, PPG and certain of its historical liability insurers negotiated a settlement with representatives of present and future asbestos claimants. That settlement was incorporated into a PC plan of reorganization that was confirmed by the Bankruptcy Court on May 24, 2013 and ultimately became effective on April 27, 2016. With the effectiveness of the plan, the preliminary injunction staying the prosecution of asbestos litigation against PPG expired by its own terms on May 27, 2016. In accordance with the settlement, the Bankruptcy Court issued a permanent channeling injunction under Section 524(g) of the Bankruptcy Code that 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 channeling 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 channeling 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."

The channeling injunction channels the Company's liability for PC Relationship Claims to a trust funded in part by PPG and its participating insurers for the benefit of current and future PC asbestos claimants (the "Trust"). 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, pending and future PC Relationship Claims. The channeling injunction does not extend to present and future claims against PPG that arise out of alleged exposure to asbestos or asbestos-containing products historically manufactured, sold and/or distributed by PPG or its subsidiaries or for which they are alleged to be liable that are not PC Relationship Claims, and does not extend to claims against PPG alleging personal injury allegedly caused by asbestos on premises presently or formerly owned, leased or occupied by PPG. These claims are referred to as non-PC Relationship Claims.

In accordance with the PC plan of reorganization, PPG's equity interest in PC was canceled. PPG satisfied its funding obligations to the Trust on June 9, 2016, when it conveyed to the Trust the stock it owned in Pittsburgh Corning Europe and 2,777,778 shares of PPG's common stock and made a cash payment to the Trust in the amount of $764 million. PPG's historical insurance carriers participating in the PC plan of reorganization are required to make cash payments to the Trust of approximately $1.7 billion, subject to a right of prepayment at a 5.5% discount rate.

On October 13, 2016, the Bankruptcy Court issued an order entering a final decree and closing the Chapter 11 case. That order provided that the Bankruptcy Court retained jurisdiction to enforce any order issued in the case and any agreements approved by the court, enforce the terms and conditions of the modified third amended Plan, and consider any requests to reopen the case.

Non-PC relationship asbestos claims

At the time PC filed for bankruptcy, PPG had been named as one of many defendants in one or more of the categories of asbestos-related claims identified above. Over the course of the 16 years during which the PC bankruptcy proceedings, and corresponding preliminary injunction staying the prosecution of asbestos-related claims against PPG, were pending, certain plaintiffs alleging premises claims filed motions seeking to lift the stay with respect to more than 1,000 individually-identified premises claims. The Bankruptcy Court granted motions to lift the stay in respect to certain of these premises claims and directed PPG to engage in a process to address any additional premises claims that were the subject of pending or anticipated lift-stay motions. As a result of the overall process as directed by the Bankruptcy Court involving more than 1,000 premises claims between 2006 and May 27, 2016, hundreds of these claims were withdrawn or dismissed without payment and approximately 650 premises claims were dismissed upon agreements by PPG and its insurers to resolve such claims in exchange for monetary payments.

With respect to the remaining claims still reportable within the inventory of 114,000 asbestos-related claims at the time PC filed for bankruptcy, the Company considers such claims to fall within one or more of the following categories: (1) claims that have been closed or dismissed as a result of processes undertaken during the bankruptcy; (2) claims that may have been previously filed on the dockets of state and federal courts in various jurisdictions, but are inactive as to the Company; and (3) claims that are subject, in whole or in part, to the channeling injunction and thus will be resolved, in whole or in part, in accordance with the Trust procedures established under the PC bankruptcy reorganization plan. As a result of the foregoing, the Company does not consider these three categories of claims to be open or active litigation against it, although the Company cannot now determine whether, or the extent to which, any of these claims may in the future be reinstituted, reinstated, or revived such that they may become open and active asbestos-related claims against it.

Current open and active claims post-Pittsburgh Corning bankruptcy

As of September 30, 2019, the Company was aware of approximately 675 open and active asbestos-related claims pending against the Company and certain of its subsidiaries. These claims consist primarily of non-PC Relationship Claims and claims against a subsidiary of PPG. The Company is defending the remaining open and active claims vigorously.

Since April 1, 2013, a subsidiary of PPG has been implicated in claims alleging death or injury caused by asbestos-containing products manufactured, distributed or sold by a North American architectural coatings business or its predecessors which was acquired by PPG. All such claims have been either served upon or tendered to the seller for defense and indemnity pursuant to obligations undertaken by the seller in connection with the Company's purchase of the North American architectural coatings business. The seller has accepted the defense of these claims subject to the terms of various agreements between the Company and the seller. The seller's defense and indemnity obligations in connection with newly filed claims ceased with respect to claims filed after April 1, 2018.

PPG has established reserves totaling approximately $180 million for asbestos-related claims that would not be channeled to the Trust which, based on presently available information, we believe will be sufficient to encompass all of PPG's current and potential future asbestos liabilities. These reserves include a $162 million reserve established

in 2009 in connection with an amendment to the PC plan of reorganization. These reserves, which are included within Other liabilities on the accompanying condensed consolidated balance sheets, represent 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 injunction staying most asbestos claims against the Company was in effect from April 2000 through May 2016. PPG will monitor the activity associated with its remaining asbestos claims and evaluate, on a periodic basis, its estimated liability for such claims, its insurance assets then available, and all underlying assumptions to determine whether any adjustment to the reserves 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, the right to pursue insurance coverage from certain of its historical insurers that did not participate in the PC plan of reorganization. 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 14, "Commitments and Contingent Liabilities," under Item 8 of the 2018 Form 10-K for additional descriptions of the following environmental matters.

As remediation at certain legacy environmental sites progresses, PPG continues to refine its assumptions underlying the estimates of the expected future costs of its remediation programs. PPG's ongoing evaluation may result in additional charges against income to increase the reserves for these sites. Remediation activities at our legacy sites are not related to the ongoing operations of PPG. In 2019 and 2018, certain charges have been recorded based on updated estimates to increase existing reserves for these sites. Certain other charges related to environmental remediation actions are also expensed as incurred.

As of September 30, 2019 and December 31, 2018, PPG had reserves for environmental contingencies associated with PPG's former chromium manufacturing plant in Jersey City, N.J. ("New Jersey Chrome"), legacy glass and chemical manufacturing sites, and for other environmental contingencies, including current manufacturing locations and National Priority List 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, 2019	December 31, 2018
New Jersey Chrome	$150	$151
Glass and chemical	72	90
Other	71	50
Total	$293	$291
Current portion	*$115*	*$105*

Pretax charges against income for environmental remediation costs are included in Other charges in the accompanying condensed consolidated statement of income. The pretax charges and cash outlays related to such environmental remediation for the three and nine months ended September 30, 2019 and 2018 were as follows:

	Three Months Ended September 30		Nine Months Ended September 30	
($ in millions)	2019	2018	2019	2018
Environmental remediation pretax charges	$24	$4	$75	$39
Cash outlays for environmental remediation activities	$21	$14	$57	$45

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. PPG regularly evaluates the assessments of costs incurred to date versus current progress and the potential cost impacts of the most recent information, including the extent of impacted soils, percentage of hazardous versus non-hazardous soils, daily soil excavation rates, and engineering, administrative and other associated costs. Based on these assessments, the reserve is adjusted accordingly. Principal factors affecting costs include refinements in the estimate of the mix of hazardous to non-hazardous soils to be excavated, an overall increase in soil volumes to be excavated, enhanced water management requirements, decreased daily soil excavation rates due to site conditions, initial estimates for remedial actions related to groundwater, and oversight and management costs. The reserve adjustments 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 the former Garfield Avenue chromium manufacturing site and five adjacent sites is expected to occur over several years after NJDEP's approval of the 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 in 2021.

PPG’s financial reserve for remediation of all New Jersey Chrome sites was $150 million at September 30, 2019. The major cost components of this liability continue to be related to excavation, transportation and disposal of impacted soil, as well as construction services. These components each account for approximately 20%, 15% and 27% 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: Glass, Chemical and Other Sites

Among other sites at which PPG is managing environmental liabilities, remedial actions are occurring at a legacy chemical manufacturing site in Barberton, Ohio, where PPG has completed a Facility Investigation and Corrective Measure Study under the United States Environmental Protection Agency's Resource Conservation and Recovery Act Corrective Action Program. PPG has also been addressing the impacts from a legacy plate glass manufacturing site in Kokomo, Indiana under the Voluntary Remediation Program of the Indiana Department of Environmental Management and a site associated with a legacy plate glass manufacturing site near Ford City, Pennsylvania under the Pennsylvania Land Recycling Program under the oversight of the Pennsylvania Department of Environmental Protection. PPG is currently performing additional investigation and remedial activities at these locations.

With respect to certain other waste sites, the financial condition of other potentially responsible parties also 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.

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 $100 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, none of which are individually significant. The loss contingencies related to these sites include significant unresolved issues such as the nature and extent of contamination at these sites and the methods that may have to be employed to remediate them.

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 $142 million and guarantees of $9 million as of September 30, 2019. The Company does not believe any loss related to such guarantees is likely.

16. Revenue Recognition

The Company recognizes revenue when control of the promised goods or services is transferred to the customer and in amounts that the Company expects to collect. The timing of revenue recognition takes into consideration the various shipping terms applicable to the Company's sales. For most transactions, control passes in accordance with agreed upon delivery terms.

The Company delivers products to company-owned stores, home centers and other regional or national consumer retail outlets, paint dealers, concessionaires and independent distributors, company-owned distribution networks, and directly to manufacturing companies and retail customers. Each product delivered to a third party customer is considered to satisfy a performance obligation. Performance obligations generally occur at a point in time and are satisfied when control of the goods passes to the customer. The Company is entitled to collection of the sales price under normal credit terms in the regions in which it operates. Accounts receivable are recognized when there is an unconditional right to consideration. Payment terms vary from customer to customer, depending on creditworthiness, prior payment history and other considerations.

The Company also provides services by applying coatings to customers' manufactured parts and assembled products and by providing technical support to certain customers. Performance obligations are satisfied over time as critical milestones are met and as services are provided. PPG is entitled to payment as the services are rendered. For the three and nine months ended September 30, 2019 and 2018, service revenue constituted approximately 5% of total revenue.

Net sales by segment and region for the three and nine months ended September 30, 2019 and 2018 were as follows:

($ in millions)	Performance Coatings		Industrial Coatings		Total Net Sales	
	Three Months Ended September 30		Three Months Ended September 30		Three Months Ended September 30	
	2019	2018	2019	2018	2019	2018
United States and Canada	$1,060	$1,028	$605	$606	$1,665	$1,634
EMEA	732	741	395	397	1,127	1,138
Asia-Pacific	278	272	366	380	644	652
Latin America	243	248	147	145	390	393
Total	$2,313	$2,289	$1,513	$1,528	$3,826	$3,817

($ in millions)	Performance Coatings		Industrial Coatings		Total Net Sales	
	Nine Months Ended September 30		Nine Months Ended September 30		Nine Months Ended September 30	
	2019	2018	2019	2018	2019	2018
United States and Canada	$3,123	$3,175	$1,841	$1,836	$4,964	$5,011
EMEA	2,213	2,259	1,283	1,338	3,496	3,597
Asia-Pacific	804	791	1,066	1,171	1,870	1,962
Latin America	711	722	433	437	1,144	1,159
Total	$6,851	$6,947	$4,623	$4,782	$11,474	$11,729

17. Reportable Business Segment Information

PPG is a multinational manufacturer with 9 operating segments (which the Company refers to as “strategic business units”) that are organized based on the Company’s major products lines. The Company’s reportable business segments include the following two segments: Performance Coatings and Industrial Coatings. The operating segments have been aggregated based on economic similarities, the nature of their products, production processes, end-use markets and methods of distribution.

The Performance Coatings reportable segment is comprised of the automotive refinish coatings, aerospace coatings, 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 OEM coatings, industrial coatings, packaging coatings, and the specialty coatings and materials operating segments. This reportable segment primarily supplies a variety of protective and decorative coatings and finishes along with adhesives, sealants, metal pretreatment products, optical monomers and coatings, precipitated silicas, and other specialty materials.

Reportable segment net sales and segment income for the three and nine months ended September 30, 2019 and 2018 were as follows:

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2019	2018	2019	2018
Net sales:				
Performance Coatings	$2,313	$2,289	$6,851	$6,947
Industrial Coatings	1,513	1,528	4,623	4,782
Total	$3,826	$3,817	$11,474	$11,729
Segment income:				
Performance Coatings	$380	$331	$1,102	$1,039
Industrial Coatings	206	169	659	631
Total	$586	$500	$1,761	$1,670
Corporate	(43)	(26)	(133)	(92)
Interest expense, net of interest income	(23)	(25)	(76)	(70)
Legacy items [(a)]	—	—	(1)	5
Environmental remediation charges, net	(21)	—	(61)	(34)
Business restructuring-related costs, net [(b)]	(18)	8	(203)	(80)
Costs associated with accounting investigations	—	(2)	(7)	(11)
Acquisition-related costs [(c)]	—	—	(17)	—
Impairment of a non-manufacturing asset	—	—	—	(9)
Legacy legal settlement	—	—	—	(10)
Costs related to customer assortment changes	—	(4)	—	(18)
Income before income taxes	$481	$451	$1,263	$1,351

(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 certain environmental remediation costs, and certain other charges which are not associated with PPG's current business portfolio.

(b) Included in business restructuring-related costs, net are business restructuring charges, accelerated depreciation of certain assets and other related costs, offset by releases related to previously approved programs.

(c) Acquisition-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 divestitures not classified as discontinued operations. These costs also include the flow-through cost of sales for the step up to fair value of inventory acquired in acquisitions.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our unaudited financial statements and the notes thereto included in the condensed consolidated financial statements in Part I, Item 1, "Financial Statements," of this report and in conjunction with the 2018 Form 10-K.

Executive Overview

Below are our key financial results for the three months ended September 30, 2019:

- Net sales were approximately $3.8 billion, up 0.2% compared to the prior year.
- Cost of sales, exclusive of depreciation and amortization ("Cost of sales") was $2.2 billion, down 3.2% versus prior year primarily due to lower sales volumes and foreign currency translation. As a percentage of sales, Cost of sales decreased 2.0%.
- Selling, general and administrative ("SG&A") expense was $887 million, up 2.3% year-over-year due to wage and other cost inflation and SG&A expense attributable to acquired businesses. As a percentage of sales, SG&A expense increased 0.5%.
- Income before income taxes was $481 million.
- The reported and adjusted effective tax rates were 22.7%.
- Income from continuing operations, net of tax (attributable to PPG) was $366 million.
- Earnings per diluted share from continuing operations was $1.54.

Below are our key financial results for the nine months ended September 30, 2019:

- Net sales were approximately $11.5 billion, down 2.2% compared to the prior year.
- Cost of sales was $6.5 billion, down 4.0% versus prior year primarily due to lower sales volumes and foreign currency translation. As a percentage of sales, Cost of sales decreased 1.1%.
- SG&A expense was $2.7 billion, down 0.3% year-over-year due to foreign currency translation. As a percentage of sales, SG&A expense increased 0.4%.
- Income before income taxes was $1,263 million.
- The reported effective tax rate was 23.5%. The adjusted effective tax rate was 23.6%.
- Income from continuing operations, net of tax (attributable to PPG) was $948 million.
- Earnings per diluted share from continuing operations was $3.98.

For the nine months ended September 30, 2019:

- Cash flows from operating activities - continuing operations was $1,275 million, an increase of $588 million year-over-year.
- Capital expenditures, including business acquisitions (net of cash acquired), was $788 million.
- The Company paid $347 million in dividends and repurchased $175 million of its outstanding common stock.

Performance in the third quarter of 2019 compared to the third quarter of 2018

Performance Overview

Net Sales by Region

	Three Months Ended September 30		Percent Change
($ in millions, except percentages)	**2019**	**2018**	**2019 vs. 2018**
United States and Canada	$1,665	$1,634	1.9 %
Europe, Middle East and Africa (EMEA)	1,127	1,138	(1.0)%
Asia-Pacific	644	652	(1.2)%
Latin America	390	393	(0.8)%
Total	$3,826	$3,817	0.2 %

Net sales increased $9 million due to the following:

- *Higher selling prices (+3%)*
- *Higher acquisition-related sales, net of dispositions (+2%)*

Partially offset by:

- *Lower sales volumes (-3%)*
- *Unfavorable foreign currency translation (-2%)*

Higher selling prices were achieved across nearly all businesses and regions, reflecting the value of our products and services. These increases helped to offset other cost inflation.

U.S. and Canada net sales increased, primarily due to higher selling prices and acquisition-related sales partially offset by lower sales volumes.

Europe, Middle East and Africa ("EMEA") net sales decreased, due to unfavorable foreign currency translation and lower sales volumes, partially offset by acquisition-related sales.

Asia-Pacific net sales decreased, due to lower sales volumes and unfavorable foreign currency translation, partially offset by acquisition-related sales.

Latin America net sales decreased, primarily due to lower sales volumes and unfavorable foreign currency translation, partially offset by acquisition-related sales and higher selling prices.

Foreign currency translation decreased net sales approximately $80 million as the U.S. dollar strengthened against several foreign currencies versus the prior year, most notably the euro, Mexican peso and Chinese yuan.

For specific business results see the Performance of Reportable Business Segments section within Item 2 of this Form 10-Q.

Cost of Sales, exclusive of depreciation and amortization

	Three Months Ended September 30		Percent Change
($ in millions, except percentages)	**2019**	**2018**	**2019 vs. 2018**
Cost of sales, exclusive of depreciation and amortization	$2,181	$2,253	(3.2)%
Cost of sales as a percentage of net sales	57.0%	59.0%	(2.0)%

Cost of sales, exclusive of depreciation and amortization, decreased $72 million primarily due to the following:

- *Lower sales volumes*
- *Foreign currency translation*

Partially offset by:

- *Cost of sales attributable to acquired businesses*
- *Other cost inflation*

Selling, general and administrative expenses

($ in millions, except percentages)	Three Months Ended September 30 2019	2018	Percent Change 2019 vs. 2018
Selling, general and administrative expenses (SG&A)	$887	$867	2.3%
Selling, general and administrative expenses as a percentage of net sales	23.2%	22.7%	0.5%

SG&A expense increased $20 million primarily due to the following:

- *Wage and other cost inflation*
- *SG&A expenses attributable to acquired businesses*

Partially offset by:

- *Foreign currency translation*

Other costs and income

($ in millions, except percentages)	Three Months Ended September 30 2019	2018	Percent Change 2019 vs. 2018
Interest expense, net of Interest income	$23	$25	(8.0)%
Other charges	$26	$25	4.0 %
Other income	($14)	($24)	(41.7)%

Other income

Other income was lower in the three months ended September 30, 2019 compared to prior year partially due to slightly lower royalty income and equity earnings.

Effective tax rate and earnings per diluted share

($ in millions, except percentages)	Three Months Ended September 30 2019	2018	Percent Change 2019 vs. 2018
Income tax expense	$109	$79	38.0%
Effective tax rate	22.7%	17.5%	5.2%
Adjusted effective tax rate, continuing operations*	22.7%	20.5%	2.2%
Earnings per diluted share, continuing operations	$1.54	$1.51	2.0%
Adjusted earnings per diluted share*	$1.67	$1.45	15.2%
*See Regulation G Reconciliation below			

The effective tax rate for the three months ending September 30, 2019 and 2018 reflects the impact of certain discrete tax items. The Company expects that its fourth quarter 2019 adjusted effective tax rate will be approximately 24%.

Adjusted earnings per diluted share from continuing operations for the three months ended September 30, 2019 increased year-over-year due to higher pretax income and items described further in the Regulation G reconciliation.

Regulation G Reconciliation - Results from Operations

PPG 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 items. 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, earnings per diluted share and the effective tax rate adjusted for these items are not recognized financial measures determined in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") and should not be considered a substitute for net income, earnings per diluted share, the effective tax rate or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, adjusted

earnings per diluted share and the adjusted effective tax rate may not be comparable to similarly titled measures as reported by other companies.

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

	Three Months Ended September 30, 2019				
($ 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[b]
As reported, continuing operations	$481	$109	22.7%	$366	$1.54
Adjusted for:					
Environmental remediation charges	21	5	25.2%	16	0.07
Business restructuring-related costs, net [a]	18	4	23.3%	14	0.06
Adjusted, continuing operations, excluding certain items	$520	$118	22.7%	$396	$1.67

	Three Months Ended September 30, 2018				
($ 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[b]
As reported, continuing operations	$451	$79	17.5%	$368	$1.51
Adjusted for:					
Costs related to customer assortment changes	4	1	24.3%	3	0.01
Releases of business restructuring reserves, net [a]	(8)	(1)	18.5%	(7)	(0.03)
Costs associated with accounting investigations	2	—	24.3%	2	0.01
Tax benefit related to U.S. Tax Cuts and Jobs Act	—	13	N/A	(13)	(0.05)
Adjusted, continuing operations, excluding certain items	$449	$92	20.5%	$353	$1.45

(a) For the three months ended September 30, 2019, included in business restructuring-related costs, net are business restructuring charges, accelerated depreciation of certain assets and other related costs, offset by releases related to previously approved programs. For the three months ended September 30, 2018, included in releases of business restructuring reserves, net are releases to previously approved programs offset by accelerated depreciation of certain assets.

(b) Earnings per diluted share is calculated based on unrounded numbers. Figures in the table may not recalculate due to rounding.

Performance of Reportable Business Segments

Performance Coatings

	Three Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	2019	2018	2019 vs. 2018	2019 vs. 2018
Net sales	$2,313	$2,289	$24	1.0%
Segment income	$380	$331	$49	14.8%

Performance Coatings net sales increased due to the following:

- *Higher selling prices (+3%)*
- *Higher acquisition-related sales, net of dispositions (+1%)*

Partially offset by:

- *Unfavorable foreign currency translation (-2%)*
- *Lower sales volumes (-1%)*

Higher selling prices were achieved across all businesses. However, unfavorable foreign currency translation impacted all businesses.

Architectural coatings - Americas and Asia-Pacific net sales, excluding the impact of currency and acquisitions ("organic sales") increased slightly with differences by channel and region. Higher selling prices offset lower sales volumes. In the U.S. and Canada, sales volumes grew modestly for both the national retail DIY and independent dealer channels, offset by a small sales decline in company-owned stores. The PPG-Comex architectural coatings businesses continued to open new concessionaire locations.

Architectural coatings - EMEA organic sales increased by a low-single-digit percentage year-over-year driven by higher selling prices. Sales volumes were down slightly and mixed by country. Sales volume growth was solid in France and certain Eastern European countries, including Romania, and modestly weaker in some other countries.

Automotive refinish coatings organic sales were higher by a low-single-digit percentage year-over-year due to higher selling prices offset by lower sales volumes, which were impacted by lower collision claim activity and customer focus on inventory management.The SEM acquisition continues to perform well and is meeting company targets.

Aerospace coatings sales volumes grew by a high-single-digit percentage in the quarter. This increase was driven by positive industry growth and PPG's commercialization of technology-advantaged products.

Protective and marine coatings organic sales increased by a mid-single-digit percentage driven by strong sales volumes in Asia and Europe and higher selling prices in each region.

Segment income increased $49 million year-over-year driven by higher selling prices, cost savings and acquisition-related income partially offset by the earnings impact of lower sales volumes, other cost inflation and unfavorable foreign currency translation of $7 million.

Looking Ahead

Looking ahead, industry demand levels are expected to be similar to those experienced in the third quarter. Sales will be sequentially lower due to normal seasonality. Acquisition-related sales are forecast to add about $20 million of sales growth primarily from SEM and Dexmet. Based on current exchange rates, foreign currency translation is expected to have a modest unfavorable impact on segment sales of approximately $40 million.

From a business perspective, continued strong performance is expected to continue at more modest levels in aerospace coatings in the fourth quarter. For architectural coatings - EMEA, fourth quarter net sales are expected to be lower sequentially due to normal seasonal patterns. Protective and marine coatings sales volume growth is expected to remain elevated in the fourth quarter with more moderate sales growth year-over-year. In automotive refinish coatings, sales volumes are expected to be flat in the fourth quarter.

Industrial Coatings

	Three Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	2019	2018	2019 vs. 2018	2019 vs. 2018
Net sales	$1,513	$1,528	($15)	(1.0)%
Segment income	$206	$169	$37	21.9 %

Industrial Coatings segment net sales decreased due to the following:

- *Lower sales volumes (-6%)*
- *Unfavorable foreign currency translation (-2%)*

Partially offset by:

- *Higher acquisition-related sales, net of dispositions (+5%)*
- *Higher selling prices (+2%)*

Higher selling prices were achieved across nearly all businesses. However, foreign currency translation affected all businesses.

Sales volumes decreased a high-single-digit percentage in the automotive original equipment manufacturer ("OEM") coatings business versus the prior year, which was consistent with the overall global industry automotive build rate. PPG’s sales volume was lower than the industry in the U.S. and Canada region, mostly due to customer mix and unexpected customer shutdowns. Sales volumes in the EMEA region were down by a mid-single-digit percentage as automotive retail sales were relatively stagnant and exports continued to decline partially due to the effect of uncertainty

over trade agreements. Asia-Pacific sales volumes were down a low-teen percentage in the third quarter compared to prior year as softness continued in China and both India and Korea experienced a large reduction in automotive production during the quarter. Partially offsetting the lower sales volumes were higher selling prices in all major regions and acquisition-related sales.

Industrial coatings organic sales were down a mid-single-digit percentage in the third quarter. Lower industrial manufacturing in all major regions broadly impacted demand in most sub-segments, including wood, general finishes, appliances and transportation. Selling prices continued to increase during the quarter.

Packaging coatings organic sales were flat versus the prior year. Sales to the beverage can industry were solid but offset by softer industry demand for canned food. Sales volumes increased in Latin America due to recent customer adoptions in the region. In the Asia-Pacific region, sales volumes were better than recent quarters and overall modestly positive compared to the prior year.

Segment income increased $37 million year-over-year, including unfavorable foreign currency translation of $3 million related to the Chinese yuan and the euro. Segment income benefited from improving selling prices, acquisition-related income and cost savings initiatives, which were offset by the earnings impact of lower sales volumes.

Looking ahead

Looking ahead, we expect sales to be lower versus the third quarter due to normal seasonality. The company will continue to prioritize operating margin recovery. In addition, acquisition-related sales are forecast to add about $75 million of sales growth from Whitford and Hemmelrath. Based on current exchange rates, foreign currency translation is expected to have a modest unfavorable impact on segment sales of approximately $30 million.

From a business perspective, industrial coatings sales volumes are anticipated to be similar in the fourth quarter due to the expected continuation of weak industrial production activity. Packaging coatings fourth quarter sales volumes are expected to remain elevated and be similar to those of the third quarter. Global automotive industry demand is expected to remain soft in the fourth quarter for most regions and the risk of prolonged customer shutdowns exists.

Performance in the first nine months of 2019 compared to the first nine months of 2018

Performance Overview

Net Sales by Region

($ in millions, except percentages)	Nine Months Ended September 30		Percent Change
	2019	**2018**	**2019 vs. 2018**
United States and Canada	$4,964	$5,011	(0.9)%
Europe, Middle East and Africa (EMEA)	3,496	3,597	(2.8)%
Asia-Pacific	1,870	1,962	(4.7)%
Latin America	1,144	1,159	(1.3)%
Total	$11,474	$11,729	(2.2)%

Net sales decreased due to the following:

- *Lower sales volumes (-3%)*
- *Unfavorable foreign currency translation (-3%)*

Partially offset by:

- *Higher selling prices (+2%)*
- *Higher acquisition-related sales, net of dispositions (+2%)*

Higher selling prices were achieved across all businesses, reflecting the value of our products and services. These increases helped to offset other cost inflation.

U.S. and Canada net sales decreased, primarily due to lower sales volumes related to the previously announced architectural national retail DIY customer assortment changes.

EMEA net sales decreased primarily due to unfavorable foreign currency translation.

Asia-Pacific net sales decreased due to unfavorable foreign currency translation and lower sales volumes.

Latin America net sales decreased due to lower sales volumes and unfavorable foreign currency translation.

Foreign currency translation decreased net sales approximately $370 million as the U.S. dollar strengthened against several foreign currencies versus the prior year, most notably the euro, Mexican peso and Chinese yuan.

For specific business results see the Performance of Reportable Business Segments section within Item 2 of this Form 10-Q.

Cost of Sales, exclusive of depreciation and amortization

	Nine Months Ended September 30		Percent Change
($ in millions, except percentages)	2019	2018	2019 vs. 2018
Cost of sales, exclusive of depreciation and amortization	$6,542	$6,813	(4.0)%
Cost of sales as a percentage of net sales	57.0%	58.1%	(1.1)%

Cost of sales, exclusive of depreciation and amortization, decreased $271 million primarily due to the following:

- *Foreign currency translation*
- *Lower sales volumes*
- *Restructuring cost savings*

Partially offset by:

- *Cost of sales attributable to acquired businesses*
- *Wage and other cost inflation*

Selling, general and administrative expenses

	Nine Months Ended September 30		Percent Change
($ in millions, except percentages)	2019	2018	2019 vs. 2018
Selling, general and administrative expenses (SG&A)	$2,710	$2,718	(0.3)%
Selling, general and administrative expenses as a percentage of net sales	23.6%	23.2%	0.4 %

SG&A expense decreased $8 million primarily due to the following:

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

Partially offset by:

- *Wage and other cost inflation*
- *SG&A expenses attributable to acquired businesses*

Other costs and income

	Nine Months Ended September 30		Percent Change
($ in millions, except percentages)	2019	2018	2019 vs. 2018
Interest expense, net of Interest income	$76	$70	8.6 %
Other charges	$69	$72	(4.2)%
Other income	($61)	($72)	(15.3)%

Other income

Other income in the nine months ended September 30, 2019 decreased compared to the prior year partially due to lower equity earnings.

Effective tax rate and earnings per diluted share

($ in millions, except percentages)	Nine Months Ended September 30		Percent Change
	2019	2018	2019 vs. 2018
Income tax expense	$297	$270	10.0 %
Effective tax rate	23.5%	20.0%	3.5 %
Adjusted effective tax rate, continuing operations*	23.6%	21.2%	2.4 %
Earnings per diluted share, continuing operations	$3.98	$4.32	(7.9)%
Adjusted earnings per diluted share*	$4.90	$4.75	3.2 %

*See Regulation G Reconciliation below

The effective tax rate for the nine months ended September 30, 2019 reflects the impact of certain discrete tax items. The Company expects that its full year 2019 adjusted effective tax rate will be between 23% and 24%.

Adjusted earnings per diluted share from continuing operations for the nine months ended September 30, 2019 and 2018 increased year-over-year due to items described further in the Regulation G reconciliation.

Regulation G Reconciliation - Results from Operations

PPG 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 items. 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, earnings per diluted share and the effective tax rate adjusted for these items are not recognized financial measures determined in accordance with U.S. GAAP and should not be considered a substitute for net income, earnings per diluted share, the effective tax rate or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, adjusted earnings per diluted share and the adjusted effective tax rate may not be comparable to similarly titled measures as reported by other companies.

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

	Nine Months Ended September 30, 2019				
($ 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[(b)]
As reported, continuing operations	$1,263	$297	23.5%	$948	$3.98
Adjusted for:					
Business restructuring-related costs, net [(a)]	203	49	24.1%	154	0.65
Costs associated with accounting investigations	7	2	28.6%	5	0.02
Environmental remediation charges, net	61	14	23.0%	47	0.20
Acquisition-related costs	17	4	23.5%	13	0.05
Adjusted, continuing operations, excluding certain items	$1,551	$366	23.6%	$1,167	$4.90

	Nine Months Ended September 30, 2018				
($ 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[(b)]
As reported, continuing operations	$1,351	$270	20.0%	$1,067	$4.32
Adjusted for:					
Costs related to customer assortment changes	18	4	24.3%	14	0.05
Environmental remediation charges	34	8	25.1%	26	0.10
Business restructuring-related costs, net [(a)]	80	20	25.2%	60	0.23
Legacy legal settlement	10	2	24.3%	8	0.03
Costs associated with accounting investigations	11	2	24.3%	9	0.04
Impairment of a non-manufacturing asset	9	2	24.3%	7	0.03
Tax benefit related to U.S. Tax Cuts and Jobs Act	—	13	N/A	(13)	(0.05)
Adjusted, continuing operations, excluding certain items	$1,513	$321	21.2%	$1,178	$4.75

(a) Included in business restructuring-related costs, net are business restructuring charges, accelerated depreciation of certain assets and other related costs, offset by releases related to previously approved programs.

(b) Earnings per diluted share is calculated based on unrounded numbers. Figures in the table may not recalculate due to rounding.

Performance of Reportable Business Segments

Performance Coatings

	Nine Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	2019	2018	2019 vs. 2018	2019 vs. 2018
Net sales	$6,851	$6,947	($96)	(1.4)%
Segment income	$1,102	$1,039	$63	6.1 %

Performance Coatings net sales decreased due to the following:

- *Unfavorable foreign currency translation (-3%)*
- *Lower sales volumes (-2%)*

Partially offset by:

- *Higher selling prices (+3%)*
- *Higher acquisition-related sales, net of dispositions (+1%)*

Higher selling prices were achieved across all businesses. However, unfavorable foreign currency translation affected all businesses.

Architectural coatings - Americas and Asia-Pacific organic sales were lower by a mid-single-digit percentage primarily driven by certain previously announced customer assortment changes in the U.S. DIY channel. The U.S. and Canada company-owned stores network net sales were relatively flat compared to the prior year. The PPG-Comex architectural coatings businesses had slightly higher organic sales and continued to open new concessionaire locations.

Architectural coatings - EMEA organic sales increased by a low-single-digit percentage year-over-year, including volume growth in certain key countries.

Automotive refinish coatings organic sales decreased by a low-single-digit percentage year-over-year. Sales volumes were impacted by softer U.S. industry demand evidenced by lower collision claims during the year.

Aerospace coatings sales volumes grew by nearly a double-digit-percentage. This increase was supported by market outperformance in all major platforms stemming from technology-advantaged products and robust industry demand.

Protective and marine coatings organic sales increased by a high-single-digit percentage driven by strong sales volumes in China and Europe.

Segment income increased $63 million year-over-year due to higher selling prices and continued cost management offset by the earnings impact of lower sales volumes, other cost inflation and unfavorable foreign currency translation of $25 million.

Industrial Coatings

	Nine Months Ended September 30		$ Change	% Change
($ in millions, except per share amounts)	2019	2018	2019 vs. 2018	2019 vs. 2018
Net sales	$4,623	$4,782	($159)	(3.3)%
Segment income	$659	$631	$28	4.4 %

Industrial Coatings segment net sales decreased due to the following:

- *Lower sales volumes (-5%)*
- *Unfavorable foreign currency translation (-4%)*

Partially offset by:

- *Higher acquisition-related sales, net of dispositions (+4%)*
- *Higher selling prices (+2%)*

Higher selling prices were achieved across all businesses. However, unfavorable foreign currency translation affected all businesses.

Sales volumes decreased a high-single-digit percentage in the automotive OEM coatings business versus the prior year, which was consistent with the overall global industry automotive build rate. Partially offsetting the lower sales volumes were acquisition-related sales from Hemmelrath and higher selling prices in all major regions.

Aggregate industrial coatings and specialty coatings and materials sales volumes were down a low-single-digit percentage. Industrial coatings sales volumes were impacted by lower coil and general finishes end-use demand. Selling prices increased during the year for both businesses.

Packaging coatings sales volumes were down a low-single-digit percentage versus the prior year, as year-over-year growth moderated due to more modest customer adoption rates for new technologies. Sales volumes increased in Latin America due to recent customer conversions in the region.

Segment income increased $28 million year-over-year. Segment income benefited from improving selling prices, acquisition-related income and prior business restructuring actions, which were partially offset by the earnings impact of lower sales volumes and unfavorable foreign currency translation which decreased segment income by $20 million, primarily related to the Chinese yuan, Mexican peso and the euro.

Liquidity and Capital Resources

PPG had cash and short-term investments totaling $1.5 billion and $1.0 billion at September 30, 2019 and December 31, 2018, respectively.

Cash from operating activities - continuing operations for the nine months ended September 30, 2019 was $1,275 million. Cash from operating activities - continuing operations was $687 million for the nine months ended September 30, 2018. Operating cash flow increased primarily due to improvement in working capital in the first nine months of 2019 compared to the prior year.

Other uses of cash during the nine months ended September 30, 2019 included:

- Capital expenditures, excluding acquisitions, of $224 million.
- Business acquisition cash spending of $564 million.
- Cash dividends paid of $347 million.
- Share repurchases of $175 million.

On August 30, 2019, PPG amended and restated the Credit Agreement with several banks and financial institutions as further discussed in Note 8, "Borrowings" under Item 1 of this Form 10-Q. The Credit Agreement amends and restates the Company's existing five year credit agreement dated as of December 18, 2015. The Credit Agreement provides for a $2.2 billion unsecured revolving credit facility. The Credit Agreement will terminate on August 30, 2024. During the nine months ended September 30, 2019 and year ended December 31, 2018, there were no borrowings outstanding under the existing or the prior credit agreement.

In August 2019, PPG completed a public debt offering of $300 million aggregate principal amount of 2.4% notes due 2024 and $300 million aggregate principal amount of 2.8% notes due 2029 and received aggregate net proceeds of $595 million. In February 2018, PPG completed a public debt offering of $300 million aggregate principal amount of 3.2% notes due 2023 and $700 million aggregate principal amount of 3.75% notes due 2028 and received aggregate net proceeds of $992 million.

Total capital spending in 2019 is expected to be up to 3.0% of full year sales. PPG expects to make mandatory contributions to its non-U.S. pension plans in the range of $5 million to $10 million during the remaining three months of 2019. PPG may make voluntary contributions to its defined benefit pension plans in 2019 and beyond.

A primary focus for the Company in 2019 will continue to be cash deployment focused on long-term shareholder value creation.

PPG's ratio of total debt, including finance leases, to total debt and equity was 51% at September 30, 2019 and 52% at December 31, 2018.

Operating Working Capital is a subset of total working capital and represents (1) trade receivables – net of the allowance for doubtful accounts, (2) FIFO 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, 2019	December 31, 2018	September 30, 2018
Trade Receivables, Net	$2,737	$2,505	$2,864
Inventories, FIFO	1,987	1,896	2,075
Trade Creditors' Liabilities	2,190	2,177	2,346
Operating Working Capital	$2,534	$2,224	$2,593
Operating Working Capital as a % of Sales	16.6%	15.3%	17.0%
Days sales outstanding	59	56	61
Days payable outstanding	95	96	97

Other Liquidity Information

The Company continues to believe that cash on hand and short term investments, cash from operations and the Company's access to capital markets will continue to be sufficient to fund our operating activities, capital spending, acquisitions, dividend payments, debt service, share repurchases, contributions to pension plans and PPG's contractual obligations.

Environmental

($ in millions)	Three Months Ended September 30		Nine Months Ended September 30	
	2019	2018	2019	2018
Cash outlays for environmental remediation activities	$21	$14	$57	$45

($ in millions)	Remainder of 2019	Annually 2020 - 2023
Projected future cash outlays for environmental remediation activities	$20 - $45	$20 - $50

Restructuring

The 2016 restructuring actions expect to achieve annualized cost savings of approximately $125 million once fully implemented. Substantially all actions from this business restructuring plan have been completed.

In May 2018, PPG initiated an $83 million global restructuring program. The program is largely centered around the change in customer assortment related to the U.S. architectural coatings DIY business. PPG recognized $18 million of savings from this program in 2018. We expect to achieve annualized cost savings from the 2018 program of $85 million once fully implemented in 2020.

In June 2019, PPG initiated a $184 million restructuring program. This program is a result of a comprehensive internal operational assessment to identify further opportunities to improve the profitability of the overall business portfolio. The 2019 program is expected to achieve approximately $125 million of annualized cost savings by the expected completion date in 2022.

Total restructuring savings are expected to be between $75 million and $85 million in 2019. In addition, the Company continues to review its cost structure to identify additional cost savings opportunities. See Note 7, “Business Restructuring,” to the accompanying condensed consolidated financial statements for further details on the Company's business restructuring programs.

Currency

Comparing exchange rates as of December 31, 2018 to September 30, 2019, the U.S. dollar strengthened against certain currencies in the countries where PPG operates, most notably the euro, British pound, Korean won, and the Chinese yuan. As a result, consolidated net assets at September 30, 2019 decreased by $32 million compared to December 31, 2018.

Comparing exchange rates during the first nine months of 2019 to those of the first nine months of 2018, the U.S. dollar strengthened against currencies of the countries within the regions PPG operates, including EMEA, Asia-Pacific, and Latin America. This had an unfavorable impact on Income before income taxes for the nine months ended September 30, 2019 of $46 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.

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 2021.

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

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 ("SEC"). 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 achieve selling price increases, the ability to recover margins, customer inventory levels, our ability to maintain favorable supplier relationships and arrangements, the timing of and the realization of anticipated cost savings from restructuring initiatives, the ability to identify additional cost savings opportunities, difficulties in integrating acquired businesses and achieving expected synergies therefrom, economic and political conditions in the markets we serve, 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, the effectiveness of our internal control over financial reporting, the results of governmental actions relating to pending investigations, the results of shareholder actions relating to the restatement of our financial statements 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 2018 Form 10-K under Item 1A 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 income, business disruption, operational problems, financial loss, legal liability to third parties, other factors set forth in Item 1A of the 2018 Form 10-K 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

Foreign Currency Risk

As of September 30, 2019 and December 31, 2018, PPG had non-U.S. dollar denominated borrowings outstanding of $2.5 billion and $2.6 billion, respectively. 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 $284 million as of September 30, 2019 and $299 million as of December 31, 2018, respectively.

The fair value of foreign currency forward contracts outstanding as of September 30, 2019 and December 31, 2018 was an asset of $44 million and $36 million, respectively. The potential reduction in PPG's Income before income taxes 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 three months ended September 30, 2019 was $282 million and $291 million for the period ended December 31, 2018.

In August 2019 and February 2018, PPG entered into U.S. dollar to euro cross currency swap contracts for $300 million and $575 million, respectively; with a combined notional amount of $875 million outstanding, resulting in an asset with a fair value of $70 million and $35 million as of September 30, 2019 and December 31, 2018, respectively. A 10% increase in the value of the euro to the U.S. dollar would have had an unfavorable effect on the fair value of these

swap contracts by reducing the value of these instruments by $86 million and $57 million at September 30, 2019 and December 31, 2018, respectively.

Interest Rate Risk

In March of 2018, PPG entered into interest rate swaps which converted $525 million of fixed rate debt to variable rate debt. The fair value of these contracts was an asset of $47 million and $8 million as of September 30, 2019 and December 31, 2018, respectively. An increase in variable interest rates of 10% would lower the fair value of these swaps and increase interest expense by $8 million and $10 million for the periods ended September 30, 2019 and December 31, 2018, respectively. A 10% increase in the interest rates in the U.S., Canada, Mexico and Europe and a 20% increase in the interest rates in Asia and South America would have an insignificant effect on PPG's variable rate debt obligations and interest expense for the periods ended September 30, 2019 and December 31, 2018, respectively. Further a 10% reduction in interest rates would have increased the present value of the Company's fixed rate debt by approximately $67 million and $84 million as of September 30, 2019 and December 31, 2018, respectively; however, such changes would not have had an effect on PPG's income before taxes or cash flows for the periods ended September 30, 2019 and December 31, 2018.

There were no other material changes in the Company’s exposure to market risk from December 31, 2018 to September 30, 2019. 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 ("the Company") 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, asbestos exposure, antitrust, employment, securities and other matters arising out of the conduct of PPG's current and past business activities. To the extent 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 may contest coverage. 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.

As previously disclosed, the SEC is conducting a non-public investigation of accounting matters described in the Explanatory Note and in Note 2, "Restatement of Previously Reported Consolidated Annual Financial Statements" under Item 8 of the Company's 2017 Form 10-K/A. On September 26, 2019, PPG announced a final settlement with the SEC as to the Company. Without admitting or denying the findings in the SEC's administrative cease-and-desist order, the Company consented to the entry of the order, which imposed no financial penalty. The Company continues to cooperate fully with the SEC's ongoing investigation relating to these accounting matters. The Company is also cooperating fully with an investigation into the same accounting matters commenced by the U.S. Attorney's Office for the Western District of Pennsylvania ("USAO"). As previously disclosed, the USAO has informed PPG that it will not pursue any action as to the Company.

On May 20, 2018, a putative securities class action lawsuit was filed in the U.S. District Court for the Central District of California against the Company and three of its current and former officers. On September 21, 2018, an Amended Class Action Complaint was filed in the lawsuit. The Amended Complaint, captioned Trevor Mild v. PPG Industries, Inc., Michael H. McGarry, Vincent J. Morales, and Mark C. Kelly, asserts securities fraud claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 on behalf of a putative class of persons who purchased or otherwise acquired stock of the Company between January 19, 2017 and May 10, 2018. The allegations relate to, among other things, allegedly false and misleading statements and/or failures to disclose information about the Company's business, operations and prospects. The parties reached a settlement in principal on May 1, 2019. On June 2, 2019, the plaintiff filed with the Court a Petition for Preliminary Approval of the proposed settlement, including the proposed settlement amount of $25 million. On July 25, 2019, the Court granted preliminary approval of the settlement, and now the parties are proceeding with the remaining procedures required to obtain final approval. The Court has scheduled October 21, 2019 for a hearing to consider the plaintiff's request for final approval of the settlement. PPG's insurance carriers confirmed to the Company insurance coverage for the full amount of the proposed settlement.

From the late 1880's until the early 1970's, PPG owned property located in Cadogan and North Buffalo Townships, Pennsylvania which was used for the disposal of solid waste from PPG's former glass manufacturing facility in Ford City, Pennsylvania. In October 2018, the Pennsylvania Department of Environmental Protection (the "DEP") approved PPG's cleanup plan for the Cadogan Property. In April 2019, PPG and the DEP entered into a consent order and agreement ("CO&A") which incorporated PPG's approved cleanup plan and a draft final permit for the collection and discharge of seeps emanating from the former disposal area. The CO&A includes a civil penalty of $1.2 million for alleged past unauthorized discharges. PPG's former disposal area is also the subject of a citizens' suit filed by the Sierra Club and PennEnvironment seeking remedial measures beyond the measures specified in PPG's approved cleanup plan, a civil penalty in addition to the penalty included in the CO&A and plaintiffs' attorneys fees. PPG believes that the citizen's suit is without merit and intends to defend itself vigorously.

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, 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. After having not been named in a new lead-related lawsuit for 15 years, PPG was named as a defendant in two new Pennsylvania state court lawsuits filed by Montgomery County and Lehigh County in the respective counties on October 4, 2018 and October 12, 2018. Both suits seek declaratory relief arising out of alleged public nuisances in the counties associated with the presence of lead paint on various buildings constructed prior to 1980. The Company believes these actions are without merit and intends to defend itself vigorously.

Item 1A. Risk Factors

There were no material changes in the Company's risk factors from the risks disclosed in the 2018 Form 10-K.

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

Issuer Purchases of Equity Securities

No shares were repurchased in the three months ended September 30, 2019 under the current $2.5 billion share repurchase program approved in December 2017. The maximum number of shares that may yet be purchased under this program is 14,010,262 shares as of September 30, 2019. This repurchase program has no expiration date.

Item 6. Exhibits

See the Index to Exhibits on page 43.

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.

4.1	Eighth Supplemental Indenture, dated as of August 15, 2019, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on August 15, 2019.
10.1	Amended and Restated Five Year Credit Agreement dated as of August 30, 2019 among PPG Industries, Inc.; the several banks and financial institutions party thereto; JPMorgan Chase Bank, N.A., as administrative agent; BNP Paribas, Citibank, N.A. MUFG Bank, Ltd. and PNC Bank, National Association, as co-syndication agents; and J.P. Morgan Chase Bank, N.A., BNP Paribas Securities Corp., Citibank, N.A., MUFG Bank, Ltd. and PNC Capital Markets LLC, as co-lead arrangers and co-bookrunners, was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on September 4, 2019.
†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*	Inline XBRL Instance Document
101.SCH**	Inline XBRL Taxonomy Extension Schema Document
101.CAL**	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF**	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB**	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE**	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)

† Filed herewith.
†† Furnished herewith.
*The instance document does not appear in the Interactive Data File because its XBRL (Extensible Business Reporting Language) tags are embedded within the Inline XBRL document.
**Attached as Exhibit 101 to this report are the following documents formatted in Inline XBRL: (i) the Condensed Consolidated Statement of Income for the nine months ended September 30, 2019 and 2018, (ii) the Condensed Consolidated Balance Sheet at September 30, 2019 and December 31, 2018, (iii) the Condensed Consolidated Statement of Cash Flows for the nine months ended September 30, 2019 and 2018, and (iv) Notes to Condensed Consolidated Financial Statements for the nine months ended September 30, 2019.

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 18, 2019

By: /s/ Vincent J. Morales
Vincent J. Morales
Senior Vice President and Chief Financial Officer
(Principal Financial Officer and Duly Authorized Officer)

By: /s/ William E. Schaupp
William E. Schaupp
Vice President and Controller
(Principal Accounting Officer and Duly Authorized Officer)

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 18, 2019

/s/ Michael H. McGarry

Michael H. McGarry
Chairman and Chief Executive Officer

Exhibit 31.2

PRINCIPAL FINANCIAL OFFICER CERTIFICATION

I, Vincent J. Morales, 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 18, 2019

/s/ Vincent J. Morales

Vincent J. Morales
Senior Vice President and Chief Financial Officer
(Principal Financial 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, 2019 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 18, 2019

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, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Vincent J. Morales, Senior 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/ Vincent J. Morales

Vincent J. Morales
Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

October 18, 2019

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.