

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 March 31, 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: 1-37644

VERSUM MATERIALS, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

47-5632014

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

8555 South River Parkway, Tempe, Arizona 85284

(Address of principal executive offices) (Zip Code)

(602) 282-1000

(Registrant's telephone number, including area code)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (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, a 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 Exchange Act).

Yes

No

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 \$1.00 per share	VSM	New York Stock Exchange

At April 26, 2019, 109,240,997 shares of common stock, par value \$1.00 per share, were outstanding.

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PRESENTATION OF INFORMATION

All references in this Quarterly Report on Form 10-Q, unless the context otherwise requires:

- “Versum,” “we,” “our,” “us” and “the company” refer to Versum Materials, Inc. and its consolidated subsidiaries for periods subsequent to the Separation and Distribution completed on October 1, 2016.
- “Air Products” refers to Air Products and Chemicals, Inc. and its consolidated subsidiaries, not including, for all periods following the Separation and Distribution, Versum.
- References to the “Separation” refer to the legal separation resulting in the allocation, transfer and assignment to Versum of the assets, liabilities and operations of Air Products’ Electronic Materials business and the creation, as a result of the Distribution, of a separate, publicly traded company, Versum, which holds the Electronic Materials business.
- References to the “Distribution” refer to the distribution by Air Products to its stockholders completed on October 1, 2016, of 100% of the outstanding shares of Versum, as further described herein.

PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

Versum Materials, Inc.

CONSOLIDATED INCOME STATEMENTS
(Unaudited)

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions, except per share data)				
Sales	\$ 326.2	\$ 340.7	\$ 665.7	\$ 671.5
Cost of sales	189.8	195.8	385.9	387.0
Selling and administrative	32.6	36.5	68.1	71.8
Research and development	11.1	11.1	24.0	23.8
Business separation, restructuring and cost reduction actions	13.8	8.2	14.9	10.0
Other (income) expense, net	(3.7)	(0.5)	(5.6)	—
Operating Income	82.6	89.6	178.4	178.9
Interest expense	13.2	11.9	26.0	23.2
Write-off of financing costs	—	—	—	2.1
Non-service components of net periodic pension cost	0.2	0.2	0.4	0.4
Income Before Taxes	69.2	77.5	152.0	153.2
Income tax provision	18.1	14.2	37.8	69.2
Net Income	51.1	63.3	114.2	84.0
Less: Net Income Attributable to Non-Controlling Interests	0.7	1.7	2.7	3.7
Net Income Attributable to Versum	\$ 50.4	\$ 61.6	\$ 111.5	\$ 80.3
Net income attributable to Versum per common share:				
Basic	\$ 0.46	\$ 0.57	\$ 1.02	\$ 0.74
Diluted	\$ 0.46	\$ 0.56	\$ 1.01	\$ 0.73
Shares used in computing per common share amounts:				
Basic	109.1	108.9	109.1	108.9
Diluted	110.0	109.7	109.9	109.8

The accompanying notes are an integral part of these statements.

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Versum Materials, Inc.
CONSOLIDATED COMPREHENSIVE INCOME STATEMENTS
(Unaudited)

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Net Income	\$ 51.1	\$ 63.3	\$ 114.2	\$ 84.0
Other Comprehensive Income (Loss), net of tax				
Translation adjustments	(6.9)	6.6	(6.0)	26.3
Gain from hedging activities	—	—	—	0.1
Pension activity, net of tax of \$0.0	0.1	—	0.1	—
Total Other Comprehensive Income (Loss)	(6.8)	6.6	(5.9)	26.4
Comprehensive Income	44.3	69.9	108.3	110.4
Net Income Attributable to Non-controlling Interests	0.7	1.7	2.7	3.7
Other Comprehensive Income (Loss) Attributable to Non-controlling Interests	(0.3)	0.9	(0.3)	1.6
Comprehensive Income Attributable to Versum	\$ 43.9	\$ 67.3	\$ 105.9	\$ 105.1

The accompanying notes are an integral part of these statements.

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Versum Materials, Inc.
CONSOLIDATED BALANCE SHEETS
(Unaudited)

	March 31, 2019	September 30, 2018
(In millions, except share data)		
Assets		
Current Assets		
Cash and cash items	\$ 390.8	\$ 399.8
Short-term investment	11.4	—
Trade receivables, net	188.1	184.4
Inventories	203.1	177.1
Contracts in progress, less progress billings	32.0	20.3
Prepaid expenses	21.1	13.6
Other current assets	19.3	17.9
Total Current Assets	865.8	813.1
Plant and equipment:		
Plant and equipment, at cost	1,105.7	1,072.1
Less: accumulated depreciation	683.4	667.0
Plant and equipment, net	422.3	405.1
Goodwill	182.5	183.0
Intangible assets, net	60.7	63.5
Other noncurrent assets	35.9	40.6
Total Noncurrent Assets	701.4	692.2
Total Assets	\$ 1,567.2	\$ 1,505.3
Liabilities and Stockholders' Equity		
Current Liabilities		
Payables and accrued liabilities	\$ 122.8	\$ 138.6
Accrued income taxes	35.4	43.3
Short-term borrowings	0.3	—
Current portion of long-term debt	5.8	5.8
Total Current Liabilities	164.3	187.7
Long-term debt	972.2	974.2
Noncurrent income tax payable	32.3	37.3
Deferred tax liabilities	38.9	41.3
Other noncurrent liabilities	53.6	52.4
Total Noncurrent Liabilities	1,097.0	1,105.2
Total Liabilities	1,261.3	1,292.9
Commitments and Contingencies - See Note 15		
Stockholders' Equity		
Common stock (par value \$1 per share; 250,000,000 shares authorized; outstanding 109,232,063 and 108,951,596 at March 31, 2019 and September 30, 2018, respectively)	109.2	109.0
Capital in excess of par	8.7	6.1
Retained earnings	175.5	81.6
Accumulated other comprehensive loss	(23.8)	(18.2)
Total Versum's Stockholders' Equity	269.6	178.5
Non-controlling Interests	36.3	33.9
Total Stockholders' Equity	305.9	212.4
Total Liabilities and Stockholders' Equity	\$ 1,567.2	\$ 1,505.3

The accompanying notes are an integral part of these statements.

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Versum Materials, Inc.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited)

	Six Months Ended March 31,	
	2019	2018
(In millions)		
Operating Activities		
Net income	\$ 114.2	\$ 84.0
Less: Net income attributable to non-controlling interests	2.7	3.7
Net income attributable to Versum	111.5	80.3
Adjustments to reconcile income to cash provided by operating activities:		
Depreciation and amortization	27.2	23.9
Deferred income taxes	(0.9)	(4.4)
Gain on sale of assets	—	(0.3)
Share-based compensation	5.2	5.0
Other adjustments	8.8	(1.2)
Working capital changes that provided (used) cash:		
Trade receivables	(5.7)	(16.9)
Inventories	(27.2)	(10.8)
Contracts in progress, less progress billings	(11.7)	(18.0)
Payables and accrued liabilities	(11.8)	(46.4)
Accrued income taxes	(18.2)	39.2
Other working capital	(3.9)	6.1
Cash Provided by Operating Activities	73.3	56.5
Investing Activities		
Additions to plant and equipment	(45.0)	(65.1)
Proceeds from sale of assets	0.7	1.0
Short-term investment	(11.4)	—
Cash Used for Investing Activities	(55.7)	(64.1)
Financing Activities		
Payments on long-term debt	(2.9)	(2.9)
Short-term borrowings	0.3	—
Dividends paid to shareholders	(17.6)	(10.9)
Other financing activity	(4.9)	(2.8)
Cash Used for Financing Activities	(25.1)	(16.6)
Effect of Exchange Rate Changes on Cash	(1.5)	7.2
Increase (Decrease) in Cash and Cash Items	(9.0)	(17.0)
Cash and Cash items-Beginning of Year	399.8	271.4
Cash and Cash items-End of Period	<u>\$ 390.8</u>	<u>\$ 254.4</u>
Supplemental Disclosure of Cash Flow Information:		
Cash paid for interest on debt	\$ 24.7	\$ 21.8
Cash paid for taxes	\$ 58.3	\$ 37.0

The accompanying notes are an integral part of these statements.

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Versum Materials, Inc.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(Unaudited)

	Common Stock	Capital in Excess of Par	Retained Earnings (Accumulated Deficit)	Accumulated Other Comprehensive Income (Loss)	Total Versum's Stockholders' Equity (Deficit)	Non-controlling Interests	Total
(In millions)							
Balance, September 30, 2017	\$ 108.8	\$ 4.8	\$ (99.6)	\$ (18.4)	\$ (4.4)	\$ 34.6	\$ 30.2
Net income	—	—	80.3	—	80.3	3.7	84.0
Cash dividend paid	—	(7.7)	(3.2)	—	(10.9)	—	(10.9)
Issuance of common stock through shared based compensation plans	0.1	—	—	—	0.1	—	0.1
Other comprehensive income	—	—	—	24.8	24.8	1.6	26.4
Share-based compensation	—	2.9	—	—	2.9	—	2.9
Balance, March 31, 2018	<u>\$ 108.9</u>	<u>\$ —</u>	<u>\$ (22.5)</u>	<u>\$ 6.4</u>	<u>\$ 92.8</u>	<u>\$ 39.9</u>	<u>\$ 132.7</u>
Balance, September 30, 2018	\$ 109.0	\$ 6.1	\$ 81.6	\$ (18.2)	\$ 178.5	\$ 33.9	\$ 212.4
Net income	—	—	111.5	—	111.5	2.7	114.2
Cash dividend paid	—	—	(17.6)	—	(17.6)	—	(17.6)
Issuance of common stock through shared based compensation plans	0.2	—	—	—	0.2	—	0.2
Other comprehensive loss	—	—	—	(5.6)	(5.6)	(0.3)	(5.9)
Share-based compensation	—	2.6	—	—	2.6	—	2.6
Balance, March 31, 2019	<u>\$ 109.2</u>	<u>\$ 8.7</u>	<u>\$ 175.5</u>	<u>\$ (23.8)</u>	<u>\$ 269.6</u>	<u>\$ 36.3</u>	<u>\$ 305.9</u>

The accompanying notes are an integral part of these statements.

Versum Materials, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Unaudited)

1. BASIS OF PRESENTATION AND MAJOR ACCOUNTING POLICIES

Versum is a global business that provides innovative solutions for specific customer applications within niche markets based upon expertise in specialty materials. Our business employs applications technology to provide solutions to the semiconductor industry through chemical synthesis, analytical technology, process engineering, and surface science. We are comprised of two operating segments, Materials and Delivery Systems and Services, under which we manage our operations and assess performance, and a Corporate segment. Versum's common stock is listed under the symbol "VSM" on the New York Stock Exchange.

Basis of Presentation

The accompanying Consolidated Financial Statements are presented on a consolidated basis and include all of the accounts and operations of Versum and its majority-owned subsidiaries. The financial statements reflect the financial position, results of operations and cash flows of Versum in accordance with generally accepted accounting principles in the United States of America ("GAAP") for interim financial information.

The financial statements are unaudited and should be read in conjunction with the Annual Consolidated Financial Statements presented in the company's Annual Report on Form 10-K for our fiscal year ended September 30, 2018. The financial statements reflect all adjustments that, in the opinion of management, are necessary for a fair statement of the results of the interim periods presented; all adjustments have been included to provide a fair statement of the results for the reporting periods presented. All significant inter-company accounts and transactions have been eliminated. The results of operations for the three and six months ended March 31, 2019 are not necessarily indicative of the results of operations for the full year.

Accounting Policies

The policies used in preparing the Consolidated Financial Statements are the same as those used in our Annual Report on Form 10-K for our fiscal year ended September 30, 2018. Other than our adoption of a new revenue recognition policy which did not have a material impact on the Consolidated Financial Statements, there have been no significant changes to these accounting policies during the three and six months ended March 31, 2019. See Note 3, Revenue from Contracts with Customers, for a discussion on the impacts of the new revenue recognition policy on our Consolidated Financial Statements.

Estimates and Assumptions

The Consolidated Financial Statements have been prepared in conformity with GAAP, using management's best estimates and judgments where appropriate. These estimates and judgments affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. The estimates and judgments will also affect the reported amounts for certain revenues and expenses during the reporting period. Actual results could differ materially from these estimates and judgments.

2. NEW ACCOUNTING GUIDANCE

Accounting Guidance Implemented

Income Taxes

In March 2018, the Financial Accounting Standards Board ("FASB") issued guidance relative to Incomes Taxes (Topic 740) that adds various Securities and Exchange Commission ("SEC") paragraphs pursuant to the issuance of the December 2017 SEC Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"), which was effective immediately. The SEC issued SAB 118 to address concerns about reporting entities' ability to timely comply with the accounting requirements to recognize all of the effects of the Tax Cuts and Jobs Act (the "Tax Act") in the

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period of enactment. SAB 118 allows disclosure that timely determination of some or all of the income tax effects from the Tax Cuts and Jobs Act are incomplete by the due date of the financial statements and if possible to provide a reasonable estimate. Our accounting for income tax effects associated with the enactment of the Tax Act are complete and recorded in our Consolidated Financial Statements as of December 31, 2018. See Note 8 for further discussion.

Net Periodic Pension Costs

In March 2017, the FASB issued guidance which requires an entity to report the service cost component of pension expense in the same line item as other compensation costs. The other components of net (benefit) cost will be required to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. This standard is effective for annual reporting periods beginning after December 15, 2017 and interim periods within those annual periods. The components of the net (benefit) cost are shown in Note 11, Retirement Benefits. The company adopted the standard effective October 1, 2018. The adoption required us to reclassify amounts out of Operating Income. This resulted in a decrease to Cost of Sales of \$0.1 million, a decrease of Selling and Administrative costs of \$0.1 million and an increase to Operating Income of \$0.2 million for the three month period ending March 31, 2018. For the six months ending March 31, 2018 Cost of Sales decreased by \$0.3 million, Selling and Administrative costs decreased by \$0.1 million and Operating Income increased by \$0.4 million. No other financial statement line items were impacted. We do not consider this to be a material impact on the Consolidated Financial Statements.

Business Combinations

In January 2017, the FASB issued guidance on the definition of a business in business combinations. The guidance clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The definition of a business affects many areas of accounting including acquisitions, disposals, goodwill, and consolidation. The guidance is effective for annual periods beginning after December 15, 2017, including interim periods within those periods. The company adopted the standard effective October 1, 2018. The adoption did not have a material impact on the Consolidated Financial Statements.

Revenue Recognition

In May 2014, the FASB issued guidance based on the principle that revenue is recognized in an amount expected to be collected and to which the entity expects to be entitled in exchange for the transfer of goods or services. In August 2015, the FASB deferred the effective date by one year, while providing the option to early adopt the standard on the original effective date. In December 2016 there were further updates to the original guidance that did not revise the effective date. The company adopted the standard effective October 1, 2018. See Note 3, Revenue from Contracts with Customers, for a discussion on the impacts on our Consolidated Financial Statements.

Cash Flow Statement Classification

In August 2016, the FASB issued guidance to reduce diversity in practice on how certain cash receipts and cash payments are classified in the statement of cash flows. The guidance is effective beginning fiscal year 2019, with early adoption permitted, and should be applied retrospectively. The company adopted the standard effective October 1, 2018. The adoption did not have a material impact on the Consolidated Financial Statements.

New Accounting Guidance to be Implemented

Leases

In February 2016, with updates in July 2018 and January 2019, the FASB issued guidance which requires lessees to recognize a right of use asset and lease liability on the balance sheet for all leases, including operating leases, with a term in excess of 12 months. The guidance also expands the quantitative and qualitative disclosure requirements. The guidance is effective in fiscal year 2020, with early adoption permitted, and originally required to be applied using a modified retrospective approach. The company is currently the lessee under various agreements for distribution equipment, vehicles and buildings that are currently accounted for as operating leases. The new guidance requires the lessee to record operating leases on the balance sheet with a right-of-use asset and corresponding liability for future payment obligations. The company will adopt

the standard effective October 1, 2019. We are currently evaluating the impact of adopting this new guidance on our Consolidated Financial Statements.

3. REVENUE FROM CONTRACTS WITH CUSTOMERS

The company adopted ASC 606 on October 1, 2018 using the modified retrospective method for all contracts not completed as of the date of adoption. The reported results for the three and six months ended March 31, 2019 reflect the application of ASC 606 guidance while the reported results for 2018 were prepared under the guidance of ASC 605, Revenue Recognition (ASC 605). The company has determined the impact of ASC 606 on opening retained earnings was immaterial as of October 1, 2018. The impact to revenues for the three and six months ended March 31, 2019 was immaterial as a result of applying ASC 606.

The adoption of ASC 606 represents a change in accounting principle that will more closely align revenue recognition with the delivery of the company's goods or services and will provide financial statement readers with enhanced disclosures. To achieve this core principle, the company applies the following five steps:

- *Identify the contract with a customer*
- *Identify the performance obligations in the contract*
- *Determine the transaction price*
- *Allocate the transaction price to performance obligations in the contract*
- *Recognize revenue when or as the company satisfies a performance obligation*

Revenue under ASC 606 is recognized when or as obligations under the terms of a contract with the company's customer have been satisfied and control has transferred to the customer. The majority of the company's performance obligations, and associated revenue, are transferred to customers at a point in time, generally upon shipment of a product to the customer or receipt of the product by the customer and without significant judgments. Installation services are not significant and are usually completed in a short period of time and therefore, recorded at a point in time when the installation services are completed, rather than over time as they are not material. Service contracts, which are transferred to the customer over time, are recorded as revenue as the services are performed. Customized equipment with no alternative future use to the company, and that have an enforceable right to payment for performance completed to date, are also recorded over time. The company considers this to be a faithful depiction of the transfer to the customer of revenue over time as the work or service is performed.

Revenue is measured as the amount of consideration the company expects to receive in exchange for transferring goods or providing services. Performance obligations promised in a contract are identified based on the products or services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the product or service either on its own or together with other resources that are readily available from third parties or from the company, and are distinct in the context of the contract, whereby the transfer of the product or service is separately identifiable from other promises in the contract. Sales, value add, and other taxes the company collects concurrent with revenue-producing activities are excluded from revenue. The company's normal payment terms vary by the type and location of its customers and the products or services offered. The time between invoicing and when payment is due is not significant. None of the company's contracts as of March 31, 2019 contain a significant financing component.

The company does not disclose information about remaining performance obligations that have original expected durations of one year or less.

Costs to Obtain and Fulfill a Contract

The company recognizes the incremental costs of obtaining contracts as an expense when incurred if the amortization period of the assets that the company otherwise would have recognized is one year or less. The incremental costs to obtain contracts was not material.

In most transactions, we have no obligations to our customers after the date products are shipped, other than pursuant to warranty obligations. Our standard warranties provide assurance to customers that the goods as delivered are free from defect or within their provided specifications. Shipping and handling fees billed to customers, if any, are recognized as

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revenue. The related shipping and handling costs are recognized in cost of sales. Based on the nature of our business returns are not material.

Shipping and handling costs associated with outbound freight after control over a product has transferred to a customer are accounted for as a fulfillment cost and are included in cost of sales.

The company estimates its allowance for doubtful accounts. The company continuously monitors collections and payments from its customers and maintains a provision for estimated credit losses based upon its historical experience and any specific customer collection issues that it has identified.

Disaggregation of Revenue

We are comprised of two primary operating segments, Materials and Delivery Systems and Services (“DS&S”), under which we manage our operations and assess performance, and a Corporate segment. Our segments are differentiated by the types of product groups they sell.

Materials

The Materials operating segment is an integrated provider of specialty materials for the high-growth electronics industry, focusing on the integrated circuit and flat-panel display markets. This segment provides the global semiconductor industry with high purity process materials for deposition, metallization, chamber cleaning and etching, chemicals mechanical planarization slurries, organosilanes, organometallics and liquid dopants for thin film deposition, and formulated chemical products for post-etch cleaning primarily for the manufacture of silicon and compound semiconductors and thin film transistor liquid crystal displays. The Materials segment is further divided into two main product groups.

- Advanced Materials (“AM”) - AM supplies products and services through three key product platforms that are employed in the fabrication of ICs. Advanced deposition materials products include high purity specialty gases and chemicals, such as organosilane and organometallic precursors that are used to deposit thin films which comprise an IC. Planarization products include chemical mechanical planarization (“CMP”) slurries and post CMP cleans that are used to prepare chips with deposited thin films for the next stage of fabrication. Surface prep and clean formulated products are designed to selectively etch and remove debris and contamination during multiple stages of the wafer fabrication process including advanced packaging.
- Process Materials (“PM”) - PM supplies products such as high-purity gases and chemicals utilized in the processes of cleaning, etching, doping, and film deposition for our semiconductor, displays and light emitting diode customers.

Given the nature of the Materials segment the majority of revenue is recognized at a point in time.

DS&S

The DS&S operating segment designs, manufactures, installs, operates, and maintains chemical and gas delivery and distribution systems for specialty gases and chemicals delivered directly to our customers’ manufacturing tools. In addition, the business provides turnkey installation services during facility construction and startup as well as onsite operating services. Below are the two product groups for DS&S.

- Equipment and installation (Gas, chemical and slurry delivery systems) - DS&S develops, designs, manufactures and sells bulk gas, specialty gas and specialty chemical cabinets and systems that are critical to managing the delivery of key materials into the semiconductor manufacturing process. DS&S also offers resources to assist both new and refurbished semiconductor fabs in the design, installation, startup, and commissioning of the gases and specialty materials delivery systems and quality assurance. The scope of installation services includes project management for installation and startup of the gas and chemical delivery systems, and inventory management. Given the nature of equipment and installation services for DS&S the majority of the revenue is recognized at a point in time.
- On-Site Services (MEGASYS): DS&S offers on-site contract services to assist customers in managing their

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inventory of gases and chemicals, including ordering, product changes and monitoring, quality assurance, operating our delivery systems, and managing the bulk gas and specialty gas operations. These services are typically performed on the customer site. Given the nature of the site services for DS&S the revenue is recognized over time.

Corporate

The Corporate segment includes certain administrative costs such as information technology, general services, human resources, legal, accounting, and other services, as well as foreign exchange gains and losses, and other income and expense that cannot be directly associated with operating segments.

The company disaggregates its revenue from contracts with customers by product group, which it believes best depicts how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors.

The following table summarizes revenue from contracts with customers disaggregated by product group:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Materials				
Advanced Materials	\$ 117.6	\$ 119.4	\$ 241.2	\$ 231.3
Process Materials	98.9	99.5	197.0	202.2
Total Materials	216.5	218.9	438.2	433.5
DS&S				
Equipment and Installations	92.6	105.1	193.5	205.5
Site Services	16.5	16.0	32.8	30.9
Total DS&S	109.1	121.1	226.3	236.4
Corporate	0.6	0.7	1.2	1.6
Total	\$ 326.2	\$ 340.7	\$ 665.7	\$ 671.5

The following table summarizes revenue from contracts with customers related to the geographic area in which the company operates:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Sales to External Customers				
United States	\$ 96.5	\$ 102.4	\$ 196.6	\$ 197.4
Taiwan	59.6	63.3	124.2	122.6
South Korea	111.1	112.7	227.1	231.2
China	19.4	26.8	38.6	47.8
Europe	16.3	15.0	32.0	30.5
Asia, excluding China, Taiwan, and South Korea	23.3	20.5	47.2	42.0
Total	\$ 326.2	\$ 340.7	\$ 665.7	\$ 671.5

Contract Balances

The following tables provide information about contract assets and contract liabilities from contracts with customers. The contract assets primarily relate to our rights to consideration for products produced but not billed at the reporting date on contracts with certain customers. The contract assets are recognized as accounts receivables when the rights become

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unconditional and the customer has been billed. Contract liabilities represent obligations to transfer goods to a customer for which we have received consideration from our customer.

A roll-forward of the company's contracts in progress, less progress billings is as follows:

(In millions)	Six Months Ended March 31, 2019
Beginning balance ⁽¹⁾	\$ 20.3
Change related to revenue in excess of billings	11.7
Ending balance ⁽¹⁾	<u>\$ 32.0</u>

⁽¹⁾ Beginning and ending balances are current

A roll-forward of the company's deferred revenue is as follows:

(In millions)	Six Months Ended March 31, 2019
Beginning balance ⁽¹⁾	\$ 18.7
Amount of deferred revenue recognized in income	(44.9)
Additions to deferred revenue	32.6
Ending balance ⁽¹⁾	<u>\$ 6.4</u>

⁽¹⁾ Beginning and ending balances are current

4. BUSINESS SEPARATION, RESTRUCTURING AND COST REDUCTION ACTIONS

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

During the three and six months ended March 31, 2019, we recognized a net charge of \$13.8 million and \$14.9 million, respectively. The net charge primarily consisted of costs associated with the previously planned merger with Entegris, Inc. ("Entegris").

During the three and six months ended March 31, 2018, we recognized a net charge of \$8.2 million and \$10.0 million, respectively. The net charge primarily consisted of additional costs as a result of the relocation of certain research and development activities and our headquarters and set up of the stand-alone organization and infrastructure.

The following table summarizes the carrying amount of the accrual for the business separation, restructuring and cost reduction actions at March 31, 2019:

(In millions)	Severance and Other Benefits
Balance, September 30, 2018	\$ 3.2
Current Period Charge	(0.3)
Cash Payments	(0.7)
Balance, March 31, 2019	<u>\$ 2.2</u>

5. INVENTORIES

The components of inventories are as follows:

	<u>March 31, 2019</u>	<u>September 30, 2018</u>
(In millions)		
Inventories at FIFO cost		
Finished goods	\$ 116.5	\$ 104.3
Work in process	17.3	15.1
Raw materials, supplies and other	69.3	57.7
Inventories	<u>\$ 203.1</u>	<u>\$ 177.1</u>

The September 30, 2018 inventory amounts have been adjusted for the company's election to change its inventory valuation method of accounting for its U.S. inventories from the last-in, first-out ("LIFO") method to the first-in, first-out ("FIFO") method effective the fourth quarter of fiscal 2018. The cost for FIFO inventory approximates replacement cost.

6. GOODWILL

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

	<u>Materials</u>	<u>Delivery Systems and Services</u>	<u>Total</u>
(In millions)			
Balance, September 30, 2018	\$ 165.6	\$ 17.4	\$ 183.0
Currency translation adjustment	(0.4)	(0.1)	(0.5)
Balance, March 31, 2019	<u>\$ 165.2</u>	<u>\$ 17.3</u>	<u>\$ 182.5</u>

Goodwill is subject to impairment testing in the fourth quarter of each fiscal year and whenever events and changes in circumstances indicate that the carrying value of goodwill might not be recoverable. There were no events or circumstances indicating that goodwill might be impaired at March 31, 2019.

7. DEBT

Components of Debt

	<u>March 31, 2019</u>	<u>September 30, 2018</u>
(In millions)		
Short-term borrowings ^(A)	\$ 0.3	\$ —
Current portion of long-term debt	5.8	5.8
Long-term debt	972.2	974.2
Total Debt	<u>\$ 978.3</u>	<u>\$ 980.0</u>

^(A) Represents borrowing under foreign lines of credit by non-U.S. subsidiaries which are short term in nature. Availability under these lines of credit at March 31, 2019 was \$19.9 million.

Long-term debt

	<u>March 31, 2019</u>	<u>September 30, 2018</u>
(In millions)		
Term loan facility under Credit Agreement	\$ 560.6	\$ 563.5
Revolving facility under Credit Agreement	—	—
5.5% Senior Notes due 2024	<u>425.0</u>	<u>425.0</u>
Total debt	985.6	988.5
Less debt discount	1.6	1.8
Less deferred debt costs	6.0	6.7
Less current portion of long-term debt	<u>5.8</u>	<u>5.8</u>
Long-term debt payable after one year	<u>\$ 972.2</u>	<u>\$ 974.2</u>

Credit Agreement

On September 30, 2016, Versum entered into a credit agreement (the “Credit Agreement”) providing for a senior secured first lien term loan B facility of \$575 million (the “Term Facility”) and a senior secured first lien revolving credit facility of \$200 million (the “Revolving Facility”) and, together with the Term Facility, the “Senior Credit Facilities”). The Senior Credit Facilities are guaranteed by Versum’s material direct and indirect wholly-owned domestic restricted subsidiaries and secured by substantially all of the assets of Versum and its subsidiary guarantors.

Borrowings under the Term Facility bore interest at a rate of either LIBOR (adjusted for statutory reserve requirements), subject to a minimum floor of 0.75%, plus a margin of 2.50% or an alternate base rate, subject to a minimum floor of 1.75%, plus a margin of 1.50%. On October 10, 2017, Versum amended its Credit Agreement. The amendment decreased the interest rate on borrowings under the Term Facility to LIBOR plus a margin of 2.00%, or an alternate base rate plus a margin of 1.00% (effective rate of 4.60% as of March 31, 2019). The amendment removed the minimum floor on LIBOR and the alternate base rate. If our total leverage ratio is equal to or less than 2.00:1.00 (calculated without any netting of cash on hand) the interest rate will decrease further to LIBOR plus a margin of 1.75%, or an alternate base rate plus a margin of 0.75%. The Term Facility matures on September 30, 2023, and will amortize in equal quarterly installments in aggregate annual amounts equal to 1.00% of the original principal amount of the Term Facility, with the balance payable on September 30, 2023.

Borrowings under the Revolving Facility bear interest initially at a rate of either LIBOR (adjusted for statutory reserve requirements) plus a margin of 2.00% or an alternate base rate plus a margin of 1.00%, subject to a 0.25% margin reduction based on achieving a first lien net leverage ratio of 1.00:1.00. A commitment fee of 0.375% initially, subject to a reduction to 0.25% based on achieving a first lien net leverage ratio of 1.00:1.00, on the unused portion of the Revolving Facility is payable quarterly in arrears. Letter of credit fees are payable on outstanding letters of credit under the Revolving Facility, and fronting fees equal to a percentage to be agreed with each issuing bank (not to exceed 0.125%) are payable to the issuing banks. The Revolving Facility matures on September 30, 2021. A maximum first lien net leverage ratio covenant (total debt net of cash on hand to total adjusted EBITDA) of 3.25:1.00 will apply if we draw upon the Revolving Facility. As of March 31, 2019, we had availability of \$200 million under the Revolving Facility.

The Credit Agreement, as amended, provides that, commencing with Versum’s fiscal year ending on September 30, 2017, a percentage of excess cash flow ranging from 0% to 50%, depending on the first lien net leverage ratio, is required to be used to prepay the Term Facility. As of March 31, 2019, there was no requirement to prepay due to excess cash flows.

Senior Notes

On September 30, 2016, Versum issued \$425 million of 5.5% Senior Notes due 2024. The Notes are unsecured senior obligations of Versum, guaranteed by each of Versum’s subsidiaries that is a guarantor under the Senior Credit Facilities. The Notes bear interest at a rate of 5.5% per annum payable semiannually on March 15 and September 15 of each year, commencing on March 15, 2017. The Notes will mature on September 30, 2024.

Versum may, at its option, redeem some or all of the Notes during such times and at such prices as described in the Indenture governing the Senior Notes, plus accrued and unpaid interest, if any, to the date of redemption.

The agreements governing our indebtedness contain a number of affirmative and negative covenants. We were in compliance with all of our covenants at March 31, 2019.

8. INCOME TAXES

For fiscal year 2019, Versum's statutory income tax rate increased in non-U.S. jurisdictions including Taiwan and Korea, which increased Versum's global effective tax rate by 1.7%. The statutory tax rate in Taiwan increased to 20.0% in fiscal year 2019 from 17.0% in the prior year. Korea had unfavorable changes in their tax laws that effectively increased Versum's tax rate in Korea by approximately 2.2%.

In fiscal 2019, Versum became subject to additional provisions in accordance with the effective dates in the U.S. Tax Act, which was enacted into law on December 22, 2017. The statutory U.S. federal income tax rate is 21.0% for the fiscal year 2019. This is a decrease from fiscal year 2018's U.S. federal tax rate of 24.5% which represented a blending of the 35.0% statutory rate under prior law and the new 21.0% statutory rate effective January 1, 2018. Additionally, Versum became subject to other new U.S. provisions including the Global Intangible Low Taxed Income (GILTI), Foreign Derived Intangible Income (FDII) deduction, Base Erosion and Anti-Abuse Tax (BEAT) and expanded business interest limitation provisions. The company has elected to treat changes to the GILTI inclusion as a period cost in the period incurred. The income tax effect of all U.S. Tax Act provisions has been considered in the current period tax expense and their net impact on the global effective tax rate for fiscal year 2019 is immaterial. The company will continue to actively monitor and analyze legal developments and new guidance throughout the year and adjust applicable calculations as necessary.

Certain other provisions of the U.S. Tax Act, described below, were recorded initially in the quarter ended December 31, 2017 and adjusted during a twelve-month measurement period in accordance with the SEC's Staff Accounting Bulletin No. 118. The company recorded a final measurement period benefit of \$1.7 million during its three-month period ended December 31, 2018, which was the final measurement period available to record provisional adjustments related to the U.S. Tax Act. As of December 31, 2018, the accounting for the income tax effects of the enactment of the U.S. Tax Act have been completed and recorded in the company's financial statements and no provisional adjustments will be made in subsequent quarters, including the three months ended March 31, 2019.

The measurement period adjustment recorded in the first quarter was a benefit related to federal and state taxes on the mandatory deemed repatriation of certain of the company's foreign accumulated earnings and reduces the company's tax on the mandatory deemed repatriation to \$52.1 million. The measurement period adjustment is non-recurring and it reduced our U.S. GAAP effective tax rate by 1.1% for the six months ended March 31, 2019. We expect to elect to pay the federal portion of the resulting liability, net of available tax credits, over the eight-year period provided in the U.S. Tax Act.

Versum records U.S. income and foreign withholding taxes on the undistributed earnings of our foreign subsidiaries and corporate joint ventures unless those earnings are indefinitely reinvested. For the six months ended March 31, 2019, the accrued expense related to withholding taxes on undistributed earnings is \$1.4 million.

9. FINANCIAL INSTRUMENTS

We enter into forward exchange contracts to hedge the fair value exposure on inter-company loans. During the three months ended March 31, 2019 and 2018, this portfolio of forward exchange contracts consisted primarily of Japanese Yen and U.S. Dollars as well as Euros and U.S. Dollars. The maximum remaining term of any forward exchange contract currently outstanding at March 31, 2019 and 2018 was approximately 1 year and 6 months, respectively. At March 31, 2019 and September 30, 2018, the total notional principal amount of our outstanding hedge contracts was \$31.5 million and \$36.1 million, respectively.

As of March 31, 2019 and September 30, 2018, there were no derivatives designated as hedging instruments. The tables below summarize the fair values of our derivatives not designated as hedging instruments and balance sheet location of these outstanding derivatives:

	March 31, 2019			
	Balance Sheet Location	Amount	Balance Sheet Location	Amount
(In millions)				
Forward exchange contracts	Other current assets	\$ —	Payables and accrued liabilities	\$ 0.3

	September 30, 2018			
	Balance Sheet Location	Amount	Balance Sheet Location	Amount
(In millions)				
Forward exchange contracts	Other current assets	\$ 0.4	Payables and accrued liabilities	\$ —

Refer to Note 10, Fair Value, which defines fair value, describes the method for measuring fair value, and provides additional disclosures regarding fair value measurements.

The table below summarizes the gain or loss related to our forward contracts:

(In millions)	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Forward Exchange Contracts, net of tax:				
Net loss recognized in other (income) expense, net ^(A)	\$ 0.2	\$ 1.9	\$ 1.1	\$ 1.9

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

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

10. FAIR VALUE

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

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

Level 1 - Quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 - Inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the asset or liability.

Level 3 - Inputs that are unobservable for the asset or liability based on our own assumptions (about the assumptions market participants would use in pricing the asset or liability).

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

Derivatives

The fair value of our forward exchange contracts is quantified using the income approach and are based on estimates using standard pricing models. These models take into account the value of future cash flows as of the balance sheet date, discounted to a present value using discount factors that match both the time to maturity and currency of the underlying instruments. The computation of the fair values of these instruments is generally performed by the company. These standard pricing models utilize inputs which are derived from or corroborated by observable market data such as interest rate yield curves and currency spot and forward rates. Therefore, the fair value of our derivatives is classified as a level 2 measurement.

Refer to Note 9, Financial Instruments, for a description of derivative instruments, including details on the balance sheet line classifications.

Long-term Debt

The fair value of our Senior Notes is based primarily on quoted market prices reported on or near the respective balance sheet date and is therefore level 1. The fair value of our Term Facility debt is based on estimates using standard pricing models that take into account the value of future cash flows as of the balance sheet date, discounted to a present value using market based assumptions including published interest rates. This standard valuation model utilizes observable market data. Therefore, the fair value of our debt is classified as a level 2 measurement.

The carrying values and fair values of our derivatives and debt are as follows:

	March 31, 2019		September 30, 2018	
	Fair Value	Carrying Value	Fair Value	Carrying Value
(In millions)				
Assets				
Forward Exchange Contracts	\$ —	\$ —	\$ 0.4	\$ 0.4
Liabilities				
Forward Exchange Contracts	\$ 0.3	\$ 0.3	\$ —	\$ —
Long-term Debt				
Senior Notes	\$ 446.3	\$ 425.0	\$ 435.6	\$ 425.0
Term Facility	560.6	560.6	567.0	563.5
Total Long-term Debt	\$ 1,006.9	\$ 985.6	\$ 1,002.6	\$ 988.5

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

11. RETIREMENT BENEFITS

Defined Benefit Pensions

Our plans provide certain international employees in Germany, Korea and Taiwan various pension benefits. Charges to expense are based upon actuarial analysis.

The components of net periodic pension costs for Versum's defined benefit pension plans are as follows:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Service cost	\$ 0.5	\$ 0.5	\$ 1.0	\$ 1.0
Interest cost	0.2	0.2	0.4	0.4
Expected return on assets	(0.1)	—	(0.1)	—
Actuarial loss amortization	0.1	—	0.1	—
Net periodic pension cost	\$ 0.7	\$ 0.7	\$ 1.4	\$ 1.4

Defined Contribution Plan

Versum provides benefits for all U.S. employees and certain non-U.S. employees under a Versum defined contribution plan.

The following table summarizes our defined contribution expense:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Defined contribution expense	\$ 2.1	\$ 2.1	\$ 4.3	\$ 4.2

12. SHARE-BASED COMPENSATION

We have the following outstanding share-based compensation awards: (a) stock options; (b) time-based restricted stock units; and (c) market-based restricted stock units.

During the six months ended March 31, 2019, under the Versum Long-Term Incentive Plan we granted annual awards of time-based restricted stock units and market-based restricted stock units, consisting of performance-based restricted stock units. In addition, during the six months ended March 31, 2018 we granted annual awards of market-based restricted stock units, consisting of performance-based restricted stock units and performance-based market stock units. Under all programs, the terms of the awards are fixed at the grant date. Generally we issue new shares upon the payout of restricted stock units and the exercise of stock options. For our Korean employees we pay cash in lieu of issuing shares with respect to restricted stock units. As of March 31, 2019, there were 4.5 million shares available for future grant under the Versum Long-Term Incentive Plan.

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Total after-tax share-based compensation awards cost recognized in the consolidated income statement is summarized below:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Before-Tax Share-Based Compensation Award Cost	\$ 2.6	\$ 2.6	\$ 5.2	\$ 5.0
Income Tax Benefit	0.5	0.6	1.0	1.2
After-Tax Share-Based Compensation Award Cost	\$ 2.1	\$ 2.0	\$ 4.2	\$ 3.8

Before-tax share-based compensation award cost is primarily included in selling and administrative expense on our consolidated income statements.

Total before-tax share-based compensation award cost by type of program was as follows:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Restricted stock units	\$ 2.4	\$ 2.4	\$ 4.8	\$ 4.7
Director awards	0.2	0.2	0.4	0.3
Before-Tax Share-Based Compensation Cost	\$ 2.6	\$ 2.6	\$ 5.2	\$ 5.0

Restricted Stock Units

New share-based compensation awards

During the six months ended March 31, 2019, under its Long-Term Incentive Plan Versum granted 297,564 time-based restricted stock units and market-based restricted stock units, consisting of performance-based restricted stock units. The time-based restricted stock units were granted at a weighted-average grant-date fair value of \$31.83 per unit which vest on September 30, 2021, subject to the holder's continued employment with the company. The performance-based restricted stock units are earned at the end of a performance period beginning October 1, 2018 and ending September 30, 2021, conditioned on the level of Versum's total shareholder return in relation to a defined peer group over the three-year performance period.

In addition, during the six months ended March 31, 2018, under its Long-Term Incentive Plan Versum granted 200,088 market-based restricted stock units, consisting of performance-based restricted stock units and performance-based market stock units. The performance-based restricted stock units are earned at the end of a performance period beginning October 1, 2017 and ending September 30, 2020, conditioned on the level of Versum's total shareholder return in relation to a defined peer group over the three-year performance period. The performance-based market stock units are earned based on the percentage change in the price of Versum's common stock over the performance period beginning October 1, 2017 and ending September 30, 2020.

Subject to the recipient's continued employment, these market-based restricted stock units granted during the six months ended March 31, 2019 and 2018 generally vest on the date that the Versum Compensation Committee certifies the payout determination under the performance goals, which date must be within 90 days after the end of the performance period. Under GAAP, both the performance-based restricted stock units and performance-based market stock units are considered market-based awards.

Vesting for time-based restricted stock units and market based restricted stock units is subject to certain exceptions in the event of involuntary termination by Versum, death, disability or retirement. Upon vesting, restricted stock units represent the right to receive shares of our common stock with the exception of our Korean employees. Our Korean employees are paid in cash based on the fair value of their vested units. Dividend equivalent rights accrue for these awards, but do not vest unless the underlying awards vest.

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The time-based restricted stock units awarded during the six months ended March 31, 2019 had an estimated grant-date fair value of \$31.83 per unit. The market based restricted stock units awarded during the six months ended March 31, 2019 and 2018 had an estimated grant-date fair value of \$40.86 and \$50.18, respectively, per unit for the performance-based restricted stock units. The market based restricted stock units awarded during the six months ended March 31, 2018 had an estimated grant-date fair value of \$45.71 per unit for the performance-based market stock units. The fair value of market-based restricted stock units was estimated using a Monte Carlo simulation model as these equity awards are tied to a market condition. The model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the grant and calculates the fair value of the awards.

We generally expense the grant-date fair value of these awards on a straight-line basis over the vesting period; however, expense recognition is accelerated for retirement eligible individuals who meet the requirements for vesting upon retirement.

The calculation of the fair value of market-based restricted stock units during the six months ended March 31, 2019 and 2018 used the following assumptions:

	Six Months Ended March 31,	
	2019	2018
(In percentages)		
Expected volatility	29.0%	28.0%
Risk-free interest rate	2.8%	1.9%
Expected dividend yield	0.7%	0.5%

A summary of restricted stock unit activity is presented below:

	Shares	Weighted Average Grant-Date Fair Value
(In millions, except weighted average fair value)		
Outstanding, September 30, 2018	1.1	\$ 29.47
Granted	0.3	36.48
Paid out	(0.3)	24.20
Outstanding, March 31, 2019	<u>1.1</u>	<u>\$ 32.63</u>
(In millions, except weighted average fair value)		
Outstanding, September 30, 2017	1.1	\$ 25.30
Granted	0.2	47.23
Paid out	(0.2)	29.68
Outstanding, March 31, 2018	<u>1.1</u>	<u>\$ 29.40</u>

Cash payments of \$0.2 million for the three and six months ended March 31, 2019 and 2018 were made for restricted stock units paid out of Korea. As of March 31, 2019 and 2018, there was \$18.3 million and \$18.9 million, respectively, of unrecognized compensation cost related to restricted stock units. The cost is expected to be recognized over a weighted average period of 2.0 and 2.3 years, respectively. The total fair value of restricted stock units paid out during the three and six months ended March 31, 2019 was \$0.5 million and \$6.3 million, respectively. The total fair value of restricted stock units paid out during the three and six months ended March 31, 2018 was \$0.0 million and \$4.8 million, respectively.

Stock Options

We may grant awards of options to purchase common stock to executive officers and selected employees. All of our outstanding stock options are a result of the conversion in connection with the Separation. The exercise price of stock options equals the market price of our stock on the date of the grant. Options generally vest incrementally over three years and remain exercisable for ten years from the date of grant.

During the three and six months ended March 31, 2019 and 2018, no stock options were granted.

A summary of stock option activity is presented below:

	Shares	Weighted Average Exercise Price
(In millions, except weighted average exercise price)		
Outstanding, September 30, 2018	0.5	\$ 18.66
Granted	—	—
Exercised	(0.1)	15.37
Outstanding, March 31, 2019	0.4	\$ 19.68
(In millions, except weighted average exercise price)		
Outstanding, September 30, 2017	0.5	\$ 18.55
Granted	—	—
Exercised	—	—
Outstanding, March 31, 2018	0.5	\$ 18.61
(In millions, except years)		
Outstanding, March 31, 2019	4.7	\$ 10.7
Exercisable, March 31, 2019	4.7	10.7
(In millions, except years)		
Outstanding, March 31, 2018	5.2	\$ 8.8
Exercisable, March 31, 2018	5.2	8.8

The aggregate intrinsic value represents the amount by which our closing stock price of \$50.31 and \$37.63 as of March 31, 2019 and 2018 exceeds the exercise price multiplied by the number of in-the-money options outstanding or exercisable.

The total intrinsic value of stock options exercised during the three and six months ended March 31, 2019 and 2018 was \$3.6 million and \$0.3 million, respectively.

Compensation cost is generally recognized over the stated vesting period consistent with the terms of the arrangement (i.e., either on a straight-line or graded-vesting basis). Expense recognition is accelerated for retirement-eligible individuals who

would meet the requirements for vesting of awards upon their retirement. As of March 31, 2019, the stock options were fully expensed.

Director Awards

In November 2018, the Board of Directors increased the annual equity awards under the Versum Long-Term Incentive Plan granted to non-employee directors from a grant date fair value of \$100,000 annually to \$115,000 annually. In the second quarter 2019 non-employee directors were granted restricted stock units for service on our Board of Directors through the 2020 annual meeting of stockholders. Subject to continued service on the Board of Directors, the restricted stock units vest on the earlier of February 7, 2020, and the date immediately prior to Versum's next annual meeting of stockholders, and will be settled in common stock upon vesting. The grant date fair value per share is equal to the closing sales price of our common stock as reported on the New York Stock Exchange on the date of grant.

During the three and six months ended March 31, 2019, \$0.2 million and \$0.4 million, respectively, in share-based compensation expense was recognized related to these awards. During the three and six months ended March 31, 2018, \$0.2 million and \$0.3 million, respectively, in share-based compensation expense was recognized related to these awards.

13. STOCKHOLDERS' EQUITY

Accumulated Other Comprehensive Income (Loss)

The table below summarizes changes in accumulated other comprehensive income (loss) ("AOCL"), net of tax:

	Net income on derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
(In millions)				
Balance, September 30, 2018	\$ —	\$ (14.8)	\$ (3.4)	\$ (18.2)
Other comprehensive loss before reclassifications	—	(6.0)	—	(6.0)
Amounts reclassified from AOCL	—	—	0.1	0.1
Net current period other comprehensive income (loss)	—	(6.0)	0.1	(5.9)
Other comprehensive loss attributable to non-controlling interest	—	(0.3)	—	(0.3)
Balance, March 31, 2019	<u>\$ —</u>	<u>\$ (20.5)</u>	<u>\$ (3.3)</u>	<u>\$ (23.8)</u>
	Net income on derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
(In millions)				
Balance, September 30, 2017	\$ (0.2)	\$ (16.0)	\$ (2.2)	\$ (18.4)
Other comprehensive income before reclassifications	0.1	26.3	—	26.4
Amounts reclassified from AOCL	—	—	—	—
Net current period other comprehensive income	0.1	26.3	—	26.4
Other comprehensive income attributable to non-controlling interest	—	1.6	—	1.6
Balance, March 31, 2018	<u>\$ (0.1)</u>	<u>\$ 8.7</u>	<u>\$ (2.2)</u>	<u>\$ 6.4</u>

The amounts reclassified out of accumulated other comprehensive loss for the six months ended March 31, 2019 and 2018 were \$0.1 million and zero, respectively.

Cash Dividend

On October 31, 2018, the company’s Board of Directors declared a quarterly cash dividend of \$0.08 per share, totaling \$8.8 million, which was paid on November 27, 2018 to shareholders of record as of November 13, 2018. On January 29, 2019, the company’s Board of Directors declared a quarterly cash dividend of \$0.08 per share, totaling \$8.8 million, which was paid on February 26, 2019 to shareholders of record as of February 12, 2019.

Future dividend declarations, if any, as well as the record and payment dates for such dividends, are subject to the final determination of the company’s Board of Directors.

14. EARNINGS PER SHARE

The following table sets forth the computation of basic and diluted earnings per share:

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions, except per share data)				
Numerator				
Net Income Attributable to Versum	\$ 50.4	\$ 61.6	\$ 111.5	\$ 80.3
Denominator				
Weighted average number of common shares - Basic	109.1	108.9	109.1	108.9
Effect of dilutive securities				
Employee stock option and other award plans	0.9	0.8	0.8	0.9
Weighted average number of common shares - Diluted	110.0	109.7	109.9	109.8
Earnings Per Common Share Attributable to Versum				
Net Income Attributable to Versum - Basic	\$ 0.46	\$ 0.57	\$ 1.02	\$ 0.74
Net Income Attributable to Versum - Diluted	0.46	0.56	1.01	0.73

For the three and six months ended March 31, 2019, outstanding share-based awards of 0.0 million and 0.1 million shares were anti-dilutive and therefore excluded from the computation of diluted earnings per share. For the three and six months ended March 31, 2018, outstanding share-based awards of 0.2 million and 0.1 million shares were anti-dilutive and therefore excluded from the computation of diluted earnings per share.

15. COMMITMENTS AND CONTINGENCIES

Litigation

Following the public announcement of the merger agreement signed between Versum and Entegris, Inc. (“Entegris Merger”), purported stockholders of Versum filed three putative class action lawsuits and one individual lawsuit in the United States District Court for the District of Delaware against Versum and the members of the Versum Board (and, in the case of one of the putative class actions, also against Entegris): *Price v. Versum Materials, Inc. et al.*, 1:19-cv-00427 (filed on March 1, 2019), *Wang v. Versum Materials, Inc. et al.*, 1:19-cv-00460 (filed on March 5, 2019), *Wheby v. Versum Materials, Inc. et al.*, 1:19-cv-00472 (filed on March 6, 2019), and *Robert v. Versum Materials, Inc. et al.*, 1:19-cv-00511 (filed on March 14, 2019). The lawsuits contain similar allegations contending, among other things, that the registration statement on Form S-4 misstates or fails to disclose certain allegedly material information in violation of federal securities laws. The individual lawsuit (*Wang*) additionally alleges that the members of the Versum Board breached their fiduciary duties in connection with the offer made by Merck KGaA, Darmstadt, Germany (“Merck KGaA”) to purchase all of the issued and outstanding shares of Versum’s common stock at a purchase price of \$48.00 per share (the “Initial Merck KGaA Proposal”).

Additionally, purported stockholders of Versum filed two putative class action lawsuits in the Court of Chancery of the State of Delaware against Versum, the members of the Versum Board, and Broadridge Corporate Issuer Solutions, Inc.:

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Plumbers and Steamfitters Local 60 Pension Trust v. Versum Materials, Inc. et al., 2019-0190-JTL (filed on March 8, 2019) and *City of Providence v. Versum Materials, Inc. et al.*, 2019-0206-JTL (filed on March 14, 2019). The lawsuits contain similar allegations contending, among other things, that the members of the Versum Board breached their fiduciary duties in connection with the Initial Merck KGaA Proposal and in instituting a shareholder rights agreement (the "Rights Agreement"). One lawsuit (*City of Providence*) additionally contains breach of fiduciary duty allegations arising out of alleged negotiations by members of the Versum Board with Entegris without board authorization and without full disclosure to the board. The lawsuits seek relief declaring that the Rights Agreement is unenforceable or enjoining its use, damages and costs, and other remedies. One lawsuit (*City of Providence*) additionally seeks to enjoin the Entegris Merger. On March 19, 2019, the Delaware Chancery Court entered an order consolidating the two lawsuits under the caption *In re Versum Materials, Inc. Stockholder Litigation*, Consolidated C.A. No. 2019-0206-JTL. The complaint previously filed by the City of Providence was designated the operative complaint. On March 31, 2019, Plaintiffs in the consolidated lawsuits filed a motion for leave to supplement the complaint. The supplement contains additional breach of fiduciary duty allegations arising out of, among other things, the Board's consideration of the Initial Merck KGaA Proposal. On April 7, 2019 the Delaware Chancery Court granted Plaintiffs' motion and on April 8, 2019 Plaintiffs filed their supplement to the operative complaint. Additionally, Plaintiffs and Versum executed a stipulation dated as of March 31, 2019 pursuant to which Plaintiffs agreed to withdraw their motion seeking to enjoin consummation of the Entegris Merger upon termination of the Rights Agreement. On April 3, following Versum's announcement of the termination of the Rights Agreement, Plaintiffs filed a letter with the court stating that Plaintiffs will no longer seek an injunction and withdrawing their request for expedited proceedings.

On April 2, 2019, a purported California class action lawsuit captioned *Inocencio Ventura v. Versum Materials, Inc.* was filed in the Superior Court of the State of California for the County of Los Angeles, containing various class action allegations under California state wage-and-hour laws, including failure to pay overtime and minimum wages and failure to provide meal and rest breaks, to persons employed in California as hourly-paid, non-exempt employees since April 2015, and other derivative claims, and seeking unspecified monetary damages and attorneys' fees.

Although we cannot predict the ultimate outcome of the litigation described in this Note 15 with certainty, the Company believes that these purported class action lawsuits are without merit and intends to defend against them vigorously.

In the normal course of business, Versum may be involved in various other legal proceedings, including commercial, environmental, health, safety, and product liability matters. Although litigation with respect to these matters is routine and incidental to the conduct of our business, such litigation may result in large monetary awards for compensatory and punitive damages. Versum does not currently believe that there are any legal proceedings, individually or in the aggregate, that are reasonably possible to have a material impact on its financial condition, results of operations, or cash flows. While Versum cannot predict the outcome of any litigation, environmental, or regulatory matter or the potential for future litigation or regulatory action, we have evaluated all litigation, environmental and regulatory proceedings, claims and assessments in which Versum is involved, and do not believe that any of these matters, individually or in the aggregate, will result in losses that are materially in excess of amounts accrued or recognized.

Refer to Note 21 of "Notes to the Annual Consolidated Financial Statements" in Item 8 of Part II of our Annual Report on Form 10-K for the fiscal year ended September 30, 2018, for additional information regarding commitments and contingencies.

16. SEGMENT INFORMATION

We are comprised of two primary operating segments, Materials and Delivery Systems and Services, under which we manage our operations and assess performance, and a Corporate segment. Our segments are differentiated by the types of products sold.

Segment

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
(In millions)				
Sales				
Materials	\$ 216.5	\$ 218.9	\$ 438.2	\$ 433.5
Delivery Systems and Services	109.1	121.1	226.3	236.4
Corporate	0.6	0.7	1.2	1.6
Total	\$ 326.2	\$ 340.7	\$ 665.7	\$ 671.5
Operating Income (Loss)				
Materials	\$ 65.4	\$ 71.7	\$ 133.0	\$ 137.8
Delivery Systems and Services	34.9	32.9	69.6	66.4
Corporate	(3.9)	(6.8)	(9.3)	(15.3)
Segment Total	\$ 96.4	\$ 97.8	\$ 193.3	\$ 188.9
Business separation, restructuring and cost reduction actions	(13.8)	(8.2)	(14.9)	(10.0)
Total	\$ 82.6	\$ 89.6	\$ 178.4	\$ 178.9

	March 31, 2019	September 30, 2018
(In millions)		
Total Assets		
Materials	\$ 889.3	\$ 862.5
Delivery Systems and Services	175.3	144.9
Corporate	502.6	497.9
Total	\$ 1,567.2	\$ 1,505.3

17. PROPOSED MERGER

On January 28, 2019, the company announced an agreement and plan of merger, dated January 27, 2019, between the company and Entegris, pursuant to which the company would merge with and into Entegris, with Entegris as the surviving corporation. Under the terms of the Entegris merger agreement, which was unanimously approved by the Boards of Directors of both companies, Versum stockholders would receive 1.120 shares of Entegris for each existing share of Versum common stock. Immediately following completion of the merger, Entegris stockholders would own approximately 52.5% and company stockholders would own approximately 47.5% of the issued and outstanding shares of the combined company (based on fully diluted shares outstanding including exercisable options only). The transaction was expected to close in the second half of 2019, subject to the satisfaction of customary closing conditions, including receipt of U.S. and international regulatory approvals and approval by the stockholders of Versum and Entegris.

On February 27, 2019, Merck KGaA sent a letter to the Versum board of directors setting forth a non-binding unsolicited proposal to acquire Versum for \$48.00 per share in cash.

Following discussions between Versum and Merck KGaA, on April 7, 2019, Merck KGaA submitted a revised proposal to the company to acquire the company for \$53.00 in cash per share. Later on April 7, 2019, the company notified Entegris that the company's Board of Directors, in consultation with its legal and financial advisors, had unanimously determined

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that this revised proposal from Merck KGaA constituted a “Superior Proposal” as defined in the merger agreement with Entegris and that Versum’s Board of Directors intended to consider whether to terminate the merger agreement with Entegris and enter into a definitive merger agreement with Merck KGaA. Consistent with the terms of the merger agreement with Entegris, Entegris had the right, during the four business day period following such notice and ending on April 11, 2019, to propose revisions to the existing merger agreement between Versum and Entegris but declined to do so.

On April 12, 2019, the company terminated the merger agreement with Entegris and paid a termination fee of \$140 million pursuant thereto to Entegris. Immediately thereafter, Versum and Merck KGaA signed an agreement and plan of merger pursuant to which a wholly owned subsidiary of Merck KGaA would merge with and into Versum, with Versum surviving the merger as a wholly owned subsidiary of Merck KGaA. Upon completion of the merger with Merck KGaA, Versum’s stockholders will have the right to receive \$53.00 per share in cash for each share of common stock that they own immediately prior to the completion of the merger.

The transaction is expected to close in the second half of 2019, subject to the approval of the company’s stockholders at a special meeting, regulatory clearances and the satisfaction of other customary closing conditions.

18. SUBSEQUENT EVENT

Cash Dividend

On April 30, 2019, the company’s Board of Directors declared a quarterly cash dividend of \$0.08 per share, to be paid on May 28, 2019 to all shareholders of record as of May 14, 2019.

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

The following discussion should be read in conjunction with, and is qualified in its entirety by reference to, the financial statements and notes thereto included in Part I, Item 1 of this Quarterly Report on Form 10-Q and our Management’s Discussion and Analysis of Financial Condition and Results of Operations for the year ended September 30, 2018, included in our Annual Report on Form 10-K. This Quarterly Report on Form 10-Q contains certain “forward-looking statements” within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements may be identified by references to future periods, and include statements about our business strategies, operating plans, anticipated growth rates, and prospects, anticipated profitability and margins, sales expectations, future operating income and Adjusted EBITDA; our ability to continue successfully providing innovative solutions to customers through technology; estimates regarding future capital requirements; estimates of expenses and cost reduction efforts; estimates of future tax liability and effective tax rates; our ability to execute on our strategy, including our ability to enhance our portfolio positions through future organic and inorganic investments; our ability to meet customer demand; estimates of the size of the market for our products; forecasted industry capital spending and anticipated demand for our products; our ability to compete successfully as a leading materials supplier to the semiconductor industry and obtain next generation node opportunities; our successful and timely completion of various capital projects; and other matters. The words “believe,” “expect,” “anticipate,” “project,” “estimate,” “budget,” “continue,” “could,” “intend,” “may,” “plan,” “potential,” “predict,” “seek,” “should,” “will,” “would,” “objective,” “forecast,” “goal,” “guidance,” “outlook,” “target,” “opportunity” and similar expressions, among others, generally identify forward-looking statements, which are based on management’s reasonable expectations and assumptions as of the date the statements were made. Actual results and the outcomes of future events may differ materially from those expressed or implied in the forward-looking statements because of a number of risks and uncertainties, including, without limitation, the ability of Merck KGaA, Darmstadt, Germany (“Merck KGaA”) to successfully complete the proposed acquisition of us or realize the anticipated benefits of the proposed transaction in the expected time-frames or at all; Merck KGaA’s ability to successfully integrate our operations into their; such integration may be more difficult, time-consuming or costly than expected; the failure to obtain our stockholders’ approval of the proposed transaction; the failure of any of the conditions to the proposed transaction to be satisfied; revenues following the proposed transaction may be lower than expected; operating costs, customer loss and business disruption (including, without limitation, difficulties in maintaining relationships with employees, customers, clients or suppliers) may be greater than expected following the proposed transaction; the retention of certain of our key employees; risks associated with the disruption of management’s attention from ongoing business operations due to the proposed transaction; the outcome of any legal proceedings related to the proposed transaction; the impact of the proposed transaction on our credit rating; the parties’ ability to meet expectations regarding the timing and completion of the proposed transaction; delays in obtaining any approvals required for the proposed transaction or an inability to obtain them on the terms proposed or on the anticipated schedule; the impact of indebtedness incurred by Merck KGaA in connection with the proposed transaction; the effects of the business combination, including the combined company’s future financial condition, operating results, strategy and plans; the business, economic and political conditions in the markets in which we operate; events beyond our control such as acts of terrorism; product supply versus demand imbalances in the semiconductor industry or in certain geographic markets may decrease the demand for our goods and services; our concentrated customer base; our dependence upon the capital expenditure cycles of our customers; our ability to continue technological innovation and successfully introduce new products to meet the evolving needs of our customers; our ability to protect and enforce our intellectual property rights and to avoid violating any third party intellectual property or technology rights; unexpected interruption of or shortages in our raw material supply; inability of sole source, limited source or qualified suppliers to deliver to us in a timely manner or at all; hazards associated with specialty chemical manufacturing, such as fires, explosions and accidents, could disrupt our operations or the operations of our suppliers or customers; increased competition and new product development by our competitors, changing customer needs and price changes in materials and components could result in declining demand for our products; operational, political and legal risks of our international operations, including government actions such as trade wars; recent changes in U.S. tax laws; the impact of changes in environmental and health and safety regulations, anticorruption enforcement, sanctions, import/export controls, tax and other legislation and regulations in jurisdictions in which Versum Materials and its affiliates operate; our available cash and access to additional capital may be limited by substantial leverage and debt service obligations; uncertainty regarding the availability of financing to us in the future and the terms of such financing; agreements governing our indebtedness may restrict our current and future operations, and hamper our ability to respond to changes or to take certain actions; government regulation of raw materials, products and facilities may impact our product manufacturing processes, handling, storage, transportation, uses and applications; possible liability for contamination, personal injury or third party impacts if hazardous materials are released into the

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environment; cyber security threats may compromise our data or disrupt our information technology applications or services; fluctuation of currency exchange rates; costs and outcomes of litigation or regulatory investigations; the timing, impact, and other uncertainties of future acquisitions or divestitures; restrictions in our governing documents and of Delaware law may prevent or delay an acquisition of us; tax and other potential liabilities to Air Products assumed in connection with the separation and spin-off; potential conflicts of interest between us and Air Products by our directors and officers; potential liabilities arising out of state and federal fraudulent conveyance laws and legal dividend requirements with respect to the separation and spin-off and related internal reorganization transactions; and other risk factors described in our most recent Annual Report on Form 10-K and in any of our subsequently filed Quarterly Reports on Form 10-Q, each as filed with the Securities and Exchange Commission ("SEC") and available on the Internet at www.sec.gov. Versum disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statements contained in this document to reflect any change in assumptions, beliefs or expectations or any change in circumstances upon which any such forward-looking statements are based.

The discussion that follows includes comparisons to non-GAAP financial measures. The presentation of non-GAAP measures is intended to enhance the usefulness of financial information by providing measures which, when viewed together with our financial results reported in accordance with GAAP, provide a more complete understanding of the factors and trends affecting our historical financial performance and projected future results. The reconciliation of reported GAAP results to non-GAAP measures is presented in this Management's Discussion and Analysis of Financial Condition and Results of Operations.

OVERVIEW

Description of the Company

Versum is a global business that provides innovative solutions for specific customer applications based on our expertise in specialty materials for the semiconductor industry. Versum is comprised of two operating segments, Materials and Delivery Systems and Services ("DS&S"), under which we manage our operations and assess performance, and a Corporate segment. Strong customer relationships, collaborative development, technology leadership, unique product positioning and a strong global infrastructure with in-region flexible manufacturing capabilities are fundamental to our business.

Versum is a leading global producer of critical materials, including high purity process materials, cleaners and etchants, slurries, organosilanes and organometallics, and equipment which we sell to the semiconductor and display industries. Through our global network, our business positions its research, manufacturing and technical support close to its customer facilities, enabling supply chain optimization and rapid response times to the product and service needs of our customers. Many of our products have undergone rigorous product performance and quality reviews by our customers to be qualified for use in their products or manufacturing processes. Once these qualification processes are completed and our products are designated by our customers for use in their processes or products, it is often time consuming and costly for our customers to change suppliers. Our products perform critical tasks in customers' products or manufacturing processes, yet typically represent a very small portion of the cost of the end product. Over the last 20 plus years, we have developed strong relationships with the majority of the industry-leading Integrated Device Manufacturers, Foundries and Original Equipment Manufacturers through on-site service and technical personnel at these customers' facilities.

In addition to our two operating segments, our Corporate segment includes certain administrative costs associated with operating a public company, foreign exchange gains and losses and other income and expense that cannot be directly associated with operating segments. Assets in the Corporate segment include cash and deferred tax assets.

Our Markets

Our business is driven primarily by the demand for semiconductors for both logic and memory and to a lower extent, displays. Growth in mobile devices, cloud computing, connectivity and data monitoring and storage are driving increasing demand for semiconductors and displays into durable goods and other devices. This has resulted in increased correlation between semiconductor demand and global gross domestic product ("GDP"). In our Materials segment, demand for our products is correlated to the level of semiconductor production which in turn is correlated to general GDP. Demand for our products is further enhanced by participation in the advanced technologies and changing architecture of semiconductor devices. In our DS&S segment, product demand more closely follows the amount of capital investment for equipment and

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manufacturing capacity in the semiconductor industry and sales are impacted by our customers' investment in new fabrication facilities or in refurbishing existing fabrication facilities.

In fiscal 2018, we experienced growth in our business due to favorable trends in the underlying semiconductor market. This included strong VNAND memory demand fueled by the industry's move to more vertical layers and the transition to 10 NM and below production in advanced logic devices. Capital spending by the semiconductor industry was at historically high levels, driving demand for equipment in our DS&S segment. In addition, increasing semiconductor output levels fueled demand for our products in the Materials segment.

Longer term semiconductor industry growth is expected to remain attractive, growing at a multiple of GDP driven by the broadening use of technology into many market segments including automotive, industrial, medical, data analytic and consumer applications.

For 2019, we expect semiconductor growth to be flat as measured by MSI (millions of square inches of silicon produced) and semiconductor capital spending, measured by WFE (wafer fab equipment spending) to be down high teens as the industry absorbs a temporary pause in underlying demand growth.

We believe semiconductor growth will continue to translate into strong demand for both new and legacy material products in our Materials segment. To take advantage of the strong market we expect to continue to innovate and increase manufacturing capability for our new products in our Advanced Materials product line. We expect to increase our investment to support organic growth to enhance our positions in key geographies such as Korea and China and improve our cost and capacity positions for key products in our Materials segment. We expect lessening headwinds from pricing and capacity constraints for certain products in our Process Materials product line.

We expect our DS&S segment to continue to benefit from the continued high level of industry capital spending on a historical basis, our position with key customers and the further development of the semiconductor market in China.

Proposed Merger

Refer to Note 17, "Proposed Merger", to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

Performance Summary

Second Quarter 2019 vs Second Quarter 2018

- Sales of \$326.2 million decreased \$14.5 million, or 4.3%, due to unfavorable price/mix of 2% and lower volumes of 1%. This decrease was driven by unfavorable price/mix in the Materials segment, primarily in Process Materials and lower equipment volumes in DS&S. Currency changes had an unfavorable impact on sales of 1%.
- Operating income of \$82.6 million decreased \$7.0 million, or 7.8%, due to unfavorable gross profit impacts of \$10.0 million primarily due to price/mix in the Materials segment and higher Materials manufacturing costs associated with new capital investments and unfavorable separation, restructuring and cost reduction actions of \$5.6 million. These impacts were partially offset by favorable Selling & Administrative and Research & Development ("SARD") of \$3.9 million, favorable Other (Income) Expense of \$3.2 million and higher volumes of \$1.5 million. Operating income margin was 25.3%, down 100 basis points ("bp").
- Adjusted EBITDA of \$110.1 million was unchanged, primarily due to favorable SARD and Other (Income) Expense of \$7.9 million and higher volumes of \$1.5 million offset by unfavorable cash gross profit impacts of \$9.4 million. Adjusted EBITDA margin was 33.8%, up 150 bp.
- Cash flows from operations for the six months ended March 31, 2019 was \$73.3 million, with cash used for capital spending of \$45.0 million.

RESULTS OF OPERATIONS

Discussion of Consolidated Results - Three Months Ended March 31, 2019 vs. Three Months Ended March 31, 2018

	Three Months Ended March 31,	
	2019	2018
(In millions)		
Sales	\$ 326.2	\$ 340.7
Cost of sales	189.8	195.8
Selling and administrative	32.6	36.5
Research and development	11.1	11.1
Business separation, restructuring and cost reduction actions	13.8	8.2
Other (income) expense, net	(3.7)	(0.5)
Operating income	82.6	89.6
Interest expense	13.2	11.9
Non-service components of periodic pension cost	0.2	0.2
Income Before Taxes	69.2	77.5
Income tax provision	18.1	14.2
Net Income	51.1	63.3
Less: Net Income Attributable to Non-controlling Interests	0.7	1.7
Net Income Attributable to Versum	\$ 50.4	\$ 61.6
Non-GAAP Basis		
Adjusted EBITDA	\$ 110.1	\$ 110.1

Three Months Ended March 31, 2019 vs. 2018

	% Change from Prior Period
	Three Months Ended March 31, 2019
Sales	
Volume	(1)%
Price/mix	(2)%
Currency	(1)%
Total Versum Change	(4)%

Sales of \$326.2 million decreased \$14.5 million, or 4.3%, due to unfavorable price/mix of 2% and lower volumes of 1%. Currency changes had an unfavorable impact on sales of 1%. The Materials segment's sales decreased 1% as volume growth was more than offset by negative price/mix and currency impacts. The DS&S segment's sales decreased 10% primarily due to lower equipment volumes.

Operating Income and Operating Margin

Operating income of \$82.6 million decreased \$7.0 million, or 7.8%, due to unfavorable gross profit impacts of \$10.0 million primarily due to price/mix in the Materials segment and higher Materials manufacturing costs associated with new capital investments and unfavorable separation, restructuring and cost reduction actions of \$5.6 million. These impacts were partially offset by favorable SARD of \$3.9 million, favorable Other (Income) Expense of \$3.2 million and higher volumes of \$1.5 million. Operating margin decreased 100 bp.

Cost of Sales and Gross Profit Margin

Cost of sales of \$189.8 million decreased \$6.0 million, or 3.1%, as a result of lower delivery systems activity of \$13.8 million partially offset by higher raw material costs of \$4.2 million and higher operating costs of \$3.6 million. Gross profit margin of 41.8% remained flat.

Selling and Administrative Expense

Selling and administrative expense of \$32.6 million decreased by \$3.9 million. The decrease was primarily due to discretionary cost management and favorable incentive compensation expense. Selling and administrative expense as a percent of sales decreased to 10.0% from 10.7%.

Research and Development

Research and development expense of \$11.1 million remained flat. Research and development expense as a percent of sales remained flat at 3.4%.

Business Separation, Restructuring and Cost Reduction Actions

During the three months ended March 31, 2019, we recognized a net charge of \$13.8 million. The net charge primarily consisted of costs associated with the previously planned merger with Entegris.

Other (Income) Expense, Net

Items recorded to other (income) expense, net arise from transactions and events not directly related to our principal income earning activities.

Other income, net was \$3.7 million for the three months ended March 31, 2019 compared to \$0.5 million for the three months ended March 31, 2018. This change was primarily due to foreign exchange impacts and interest income.

Interest Expense

Interest incurred increased \$1.3 million due to interest rate fluctuations.

Effective Tax Rate

The effective tax rate equals the income tax provision divided by income before taxes. The effective tax rate was 26.2% for the three months ended March 31, 2019 compared to 18.3% for the three months ended March 31, 2018. The increase in effective tax rate was attributable primarily to (1) a non-recurring provisional benefit recorded in the prior year related to the deemed mandatory repatriation of certain accumulated foreign earnings and revaluation of deferred tax assets charge as a result of the U.S. Tax Act, (2) a charge in the current year period related to the non-deductibility of certain transaction related costs and changes in global pretax mix and statutory tax rates in certain jurisdictions, offset by (3) a net benefit in the current year period for provisions in connection with the U.S. Tax Act, namely GILTI, BEAT and FDII, that became effective in fiscal year 2019.

Discussion of Consolidated Results - Six Months Ended March 31, 2019 vs. Six Months Ended March 31, 2018

	Six Months Ended March 31,	
	2019	2018
(In millions)		
Sales	\$ 665.7	\$ 671.5
Cost of sales	385.9	387.0
Selling and administrative	68.1	71.8
Research and development	24.0	23.8
Business separation, restructuring and cost reduction actions	14.9	10.0
Other (income) expense, net	(5.6)	—
Operating income	178.4	178.9
Interest expense	26.0	23.2
Write-off of financing costs	—	2.1
Non-service components of periodic pension cost	0.4	0.4
Income Before Taxes	152.0	153.2
Income tax provision	37.8	69.2
Net Income	114.2	84.0
Less: Net Income Attributable to Non-controlling Interests	2.7	3.7
Net Income Attributable to Versum	\$ 111.5	\$ 80.3
Non-GAAP Basis		
Adjusted EBITDA	\$ 220.5	\$ 212.8

Six Months Ended March 31, 2019 vs. 2018

	% Change from Prior Period
	Six Months Ended March 31, 2019
Sales	
Volume	2 %
Price/mix	(2)%
Currency	(1)%
Total Versum Change	(1)%

Sales of \$665.7 million decreased \$5.8 million, or 0.9%, due to unfavorable price/mix of 2% and unfavorable currency impacts of 1% partially offset by higher volumes of 2%. The Materials segment's sales increased 1% led by volume growth in both Advanced Materials and Process Materials partially offset by unfavorable price/mix primarily in Process Materials and unfavorable currency impacts. The DS&S segment's sales decreased 4% driven by softer equipment demand.

Operating Income and Operating Margin

Operating income of \$178.4 million decreased \$0.5 million, or 0.3%, due to unfavorable gross profit impacts of \$16.1 million and unfavorable separation, restructuring and cost reduction actions of \$4.9 million. These impacts were partially offset by higher volumes of \$11.2 million, favorable Other (Income) Expense of \$5.6 million and favorable SARD of \$3.5 million. Operating margin increased 20 bp.

Cost of Sales and Gross Profit Margin

Cost of sales of \$385.9 million decreased \$1.1 million, or 0.3%, as a result of lower delivery systems activity of \$14.0 million partially offset by higher raw material costs of \$8.9 million and higher operating costs of \$4.0 million. Gross profit margin of 42.0% remained flat.

Selling and Administrative Expense

Selling and administrative expense of \$68.1 million decreased by \$3.7 million. The decrease was primarily due to cost management and favorable incentive compensation expense. Selling and administrative expense as a percent of sales decreased to 10.2% from 10.7%.

Research and Development

Research and development expense of \$24.0 million increased \$0.2 million, or 0.8%. There were no significant items contributing to the increase. Research and development expense as a percent of sales remained flat at 3.6%.

Business Separation, Restructuring and Cost Reduction Actions

During the six months ended March 31, 2019, we recognized a net charge of \$14.9 million. The net charge primarily consisted of costs associated with the previously planned merger with Entegris.

Other (Income) Expense, Net

Items recorded to other (income) expense, net arise from transactions and events not directly related to our principal income earning activities.

Other income, net was \$5.6 million for the six months ended March 31, 2019 compared to \$0.0 million for the six months ended March 31, 2018. This change was primarily due to foreign exchange impacts and interest income.

Interest Expense

Interest incurred increased \$2.8 million due to interest rate fluctuations.

Effective Tax Rate

The effective tax rate equals the income tax provision divided by income before taxes. The effective tax rate was 24.9% for the six months ended March 31, 2019 compared to 45.2% for the six months ended March 31, 2018. The decrease in effective tax rate was attributable primarily to (1) a non-recurring charge related to the fiscal year 2018 deemed mandatory repatriation of certain accumulated foreign earnings and revaluation of deferred tax assets resulting from the U.S. Tax Act, offset by (2) a charge in fiscal year 2019 related to changes in global pretax mix and statutory tax rates in certain jurisdictions, (3) a decrease in tax benefits arising from lower foreign exchange losses in various foreign jurisdictions in fiscal year 2019, (4) a charge for non-deductibility of certain transaction costs in fiscal year 2019 and (5) a net charge for additional provisions of the U.S. Tax Act, namely GILTI, BEAT and FDII, that became effective in fiscal year 2019. See Note 8, "Income Taxes", to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES

The discussion of our results includes comparisons to non-GAAP financial measures, including Adjusted EBITDA and Adjusted EBITDA Margin. The presentation of non-GAAP measures is intended to enhance the usefulness of financial information by providing measures which management uses internally to evaluate our operating performance.

We use non-GAAP measures to assess our operating performance by excluding certain disclosed items that we believe are not representative of our underlying business. Management may use these non-GAAP measures to evaluate our performance period over period and relative to competitors in our industry, to analyze underlying trends in our business, to establish operational budgets and forecasts or for incentive compensation purposes. We use Adjusted EBITDA to calculate performance-based cash bonuses. We use Segment Adjusted EBITDA as the primary measure to evaluate the ongoing performance of our business segments. We believe non-GAAP financial measures provide security analysts, investors and other interested parties with meaningful information to understand our underlying operating results and to analyze financial and business trends. Non-GAAP financial measures, including Adjusted EBITDA, should not be viewed in isolation, are not a substitute for GAAP measures, and have limitations which include but are not limited to:

- Our measures exclude (1) expenses related to business separation, restructuring and cost reduction actions, as detailed in Note 4, “Business Separation, Restructuring and Cost Reduction Actions”, to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q, and (2) the write-off of financing costs, each of which we do not consider to be representative of our underlying business operations. However, these disclosed items represent costs to Versum.
- Though not business operating costs, interest expense, non-service components of net periodic pensions costs and income tax provision represent ongoing costs of Versum.
- Depreciation and amortization charges represent the wear and tear or reduction in value of the plant, equipment, and intangible assets which permit us to manufacture and market our products.
- Other companies may define non-GAAP measures differently than we do, limiting their usefulness as comparative measures.

A reader may find any one or all of these items important in evaluating our performance. Management compensates for the limitations of using non-GAAP financial measures by using them only to supplement our GAAP results to provide a more complete understanding of the factors and trends affecting our business. In evaluating these non-GAAP financial measures, the reader should be aware that we may incur expenses similar to those eliminated in this presentation in the future.

Presented below is a reconciliation of the reported GAAP results to the non-GAAP measure:

Adjusted EBITDA and EBITDA Margin

We define Adjusted EBITDA as net income excluding certain disclosed items, which we do not believe to be indicative of underlying business trends, before interest expense, write-off of financing costs, non-service components of net periodic pension costs, income tax provision, depreciation and amortization expense, non-controlling interest and business separation, restructuring, and cost reduction actions. Adjusted EBITDA provides a useful metric for management to assess operating performance. Adjusted EBITDA margin is calculated by dividing Adjusted EBITDA by sales.

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Three Months Ended March 31, 2019 vs. 2018

Below is a reconciliation of net income to Adjusted EBITDA:

	Three Months Ended March 31,	
	2019	2018
(In millions, except percentages)		
Net Income Attributable to Versum	\$ 50.4	\$ 61.6
Add: Interest expense	13.2	11.9
Add: Non-service components of net periodic pension cost	0.2	0.2
Add: Income tax provision	18.1	14.2
Add: Depreciation and amortization	13.7	12.3
Add: Non-controlling interests	0.7	1.7
Add: Business separation, restructuring and cost reduction actions	13.8	8.2
Adjusted EBITDA	\$ 110.1	\$ 110.1
Adjusted EBITDA Margin	33.8%	32.3%
Change from prior year	\$ —	
% change from prior year	—%	

Adjusted EBITDA of \$110.1 million was flat primarily due to favorable SARD and Other (Income) Expense of \$7.9 million and higher volumes of \$1.5 million offset by unfavorable cash gross profit impacts of \$9.4 million.

SEGMENT LEVEL FINANCIAL RESULTS

Sales

	Three Months Ended March 31,	
	2019	2018
(In millions)		
Materials	\$ 216.5	\$ 218.9
DS&S	109.1	121.1
Corporate	0.6	0.7
Total Company Sales	\$ 326.2	\$ 340.7

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

	Three Months Ended March 31,	
	2019	2018
(In millions, except percentages)		
Materials		
Operating income	\$ 65.4	\$ 71.7
Add: Depreciation and amortization	12.8	11.6
Segment Adjusted EBITDA	\$ 78.2	\$ 83.3
Segment Adjusted EBITDA margin^(A)	36.1%	38.1%
DS&S		
Operating income	\$ 34.9	\$ 32.9
Add: Depreciation and amortization	0.7	0.4
Segment Adjusted EBITDA	\$ 35.6	\$ 33.3
Segment Adjusted EBITDA margin^(A)	32.6%	27.5%
Corporate		
Operating loss	\$ (3.9)	\$ (6.8)
Add: Depreciation and amortization	0.2	0.3
Segment Adjusted EBITDA	\$ (3.7)	\$ (6.5)
Total Versum Adjusted EBITDA	\$ 110.1	\$ 110.1

(A) Segment adjusted EBITDA margin is calculated by dividing segment Adjusted EBITDA by segment sales.

Below is a reconciliation of segment total operating income to consolidated operating income:

	Three Months Ended March 31,	
	2019	2018
(In millions)		
Operating Income		
Segment total	\$ 96.4	\$ 97.8
Business separation, restructuring and cost reduction actions	(13.8)	(8.2)
Combined Total	\$ 82.6	\$ 89.6

Materials

	% Change from Prior Period Three Months Ended March 31, 2019	
	Sales	
Volume	3 %	
Price/mix	(3)%	
Currency	(1)%	
Total Materials Sales Change	(1)%	

Sales of \$216.5 million decreased \$2.4 million, or 1.1%, primarily due to unfavorable price/mix of 3% and unfavorable currency impacts of 1% partially offset by higher volumes of 3%. The impacts were across both Advanced Materials and Process Materials.

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Operating income of \$65.4 million decreased \$6.3 million, or 8.8%, due to unfavorable gross profit impacts of \$13.5 million primarily from Process Materials price/mix and higher manufacturing costs related to the start-up of new capital investments partially offset by higher volumes of \$3.6 million and favorable SARD and other costs of \$3.6 million.

Adjusted EBITDA of \$78.2 million decreased \$5.1 million, or 6.1%, due to unfavorable gross profit impacts of \$12.8 million primarily from Process Materials price/mix and higher manufacturing costs related to the start-up of new capital investments partially offset by favorable SARD and other costs of \$4.1 million and higher volumes of \$3.6 million. Adjusted EBITDA margin decreased by 200 bp to 36.1%.

Delivery Systems and Services

	% Change from Prior Period
	Three Months Ended March 31, 2019
Sales	
Volume	(9)%
Price/mix	— %
Currency	(1)%
Total DS&S Sales Change	(10)%

Sales of \$109.1 million decreased \$12.0 million, or 9.9%, due to lower equipment demand.

Operating income of \$34.9 million increased \$2.0 million, or 6.1%, due to favorable gross profit impacts of \$4.0 million from product mix and project profitability and favorable SARD and other costs of \$0.1 million partially offset by lower volumes of \$2.1 million.

Adjusted EBITDA of \$35.6 million increased \$2.3 million, or 6.9%, due to favorable gross profit impacts of \$4.2 million from product mix and project profitability and favorable SARD and other costs of \$0.2 million partially offset by lower volumes of \$2.1 million. Adjusted EBITDA margin of 32.6% increased 510 bp.

Corporate

Operating loss of \$3.9 million improved by \$2.9 million, or 42.6%. The improvement was driven by foreign exchange impacts and interest income.

Adjusted EBITDA loss of \$3.7 million improved by \$2.8 million, or 43.1%. The improvement was driven by foreign exchange impacts and interest income.

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Six Months Ended March 31, 2019 vs. 2018

Below is a reconciliation of net income to Adjusted EBITDA:

	Six Months Ended March 31,	
	2019	2018
(In millions, except percentages)		
Net Income Attributable to Versum	\$ 111.5	\$ 80.3
Add: Interest expense	26.0	23.2
Add: Write-off of financing costs	—	2.1
Add: Non-service components of net periodic pension cost	0.4	0.4
Add: Income tax provision	37.8	69.2
Add: Depreciation and amortization	27.2	23.9
Add: Non-controlling interests	2.7	3.7
Add: Business separation, restructuring and cost reduction actions	14.9	10.0
Adjusted EBITDA	\$ 220.5	\$ 212.8
Adjusted EBITDA Margin	33.1%	31.7%
Change from prior year	\$ 7.7	
% change from prior year	3.6%	

Adjusted EBITDA of \$220.5 million increased \$7.7 million, or 3.6%, primarily due to higher volumes of \$11.2 million and favorable SARD and other costs of \$10.5 million partially offset by unfavorable gross profit impacts of \$14.0 million.

SEGMENT LEVEL FINANCIAL RESULTS

Sales

	Six Months Ended March 31,	
	2019	2018
(In millions)		
Materials	\$ 438.2	\$ 433.5
DS&S	226.3	236.4
Corporate	1.2	1.6
Total Company Sales	\$ 665.7	\$ 671.5

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

	Six Months Ended March 31,	
	2019	2018
(In millions, except percentages)		
Materials		
Operating income	\$ 133.0	\$ 137.8
Add: Depreciation and amortization	25.4	22.6
Segment Adjusted EBITDA	\$ 158.4	\$ 160.4
Segment Adjusted EBITDA margin^(A)	36.1%	37.0%
DS&S		
Operating income	\$ 69.6	\$ 66.4
Add: Depreciation and amortization	1.4	0.7
Segment Adjusted EBITDA	\$ 71.0	\$ 67.1
Segment Adjusted EBITDA margin^(A)	31.4%	28.4%
Corporate		
Operating loss	\$ (9.3)	\$ (15.3)
Add: Depreciation and amortization	0.4	0.6
Segment Adjusted EBITDA	\$ (8.9)	\$ (14.7)
Total Versum Adjusted EBITDA	\$ 220.5	\$ 212.8

(A) Segment adjusted EBITDA margin is calculated by dividing segment Adjusted EBITDA by segment sales.

Below is a reconciliation of segment total operating income to consolidated operating income:

	Six Months Ended March 31,	
	2019	2018
(In millions)		
Operating Income		
Segment total	\$ 193.3	\$ 188.9
Business separation, restructuring and cost reduction actions	(14.9)	(10.0)
Combined Total	\$ 178.4	\$ 178.9

Materials

	% Change from Prior Period
	Six Months Ended March 31, 2019
Sales	
Volume	4 %
Price/mix	(2)%
Currency	(1)%
Total Materials Sales Change	1 %

Sales of \$438.2 million increased \$4.7 million, or 1.1%, primarily due to higher volumes of 4%. The higher volumes of 4% were driven by volume growth in both Advanced Materials and Process Materials. These increases were partially offset by unfavorable price/mix of 2% primarily in Process Materials and unfavorable currency impacts of 1% in both Advanced Materials and Process Materials.

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Operating income of \$133.0 million decreased \$4.8 million, or 3.5%, due to unfavorable gross profit impacts of \$20.2 million primarily from price/mix impacts in Process Materials and higher manufacturing costs and unfavorable currency impacts in Process Materials and Advanced Materials partially offset by higher volumes of \$12.4 million and favorable SARD and other costs of \$3.0 million.

Adjusted EBITDA of \$158.4 million decreased \$2.0 million, or 1.2%, due to unfavorable gross profit impacts of \$18.7 million primarily from price/mix impacts in Process Materials and higher manufacturing costs and unfavorable currency impacts in Process Materials and Advanced Materials partially offset by higher volumes of \$12.4 million and favorable SARD and other costs of \$4.3 million. Adjusted EBITDA margin of 36.1% decreased 90 bp, primarily due to unfavorable gross profit impacts.

Delivery Systems and Services

	% Change from Prior Period
	Six Months Ended March 31, 2019
Sales	
Volume	(3)%
Price/mix	— %
Currency	(1)%
Total DS&S Sales Change	(4)%

Sales of \$226.3 million decreased \$10.1 million, or 4.3%. Sales were impacted by lower equipment sales.

Operating income of \$69.6 million increased \$3.2 million, or 4.8%, due to favorable gross profit impacts of \$5.1 million from product mix and project profitability partially offset by lower volumes of \$1.1 million and unfavorable SARD and other costs of \$0.8 million.

Adjusted EBITDA of \$71.0 million increased \$3.9 million, or 5.8%, due to favorable gross profit impacts of \$5.7 million from product mix and project profitability partially offset by lower volumes of \$1.1 million and unfavorable SARD and other costs of \$0.7 million. Adjusted EBITDA margin of 31.4% increased 300 bp.

Corporate

Operating loss of \$9.3 million improved by \$6.0 million, or 39.2%. The improvement was driven by foreign exchange impacts and interest income.

Adjusted EBITDA loss of \$8.9 million improved by \$5.8 million, or 39.5%. The improvement was driven by foreign exchange impacts and interest income.

LIQUIDITY AND CAPITAL RESOURCES

Historically, a significant portion of our cash balances are generated by operating activities. Our primary sources of liquidity are cash on hand, which was \$390.8 million at March 31, 2019, our cash flows from operations, our Revolving Facility and various non-U.S. credit facilities. We anticipate that our primary uses of cash will be for working capital, debt service, capital expenditures for expansion, productivity and maintenance, potential dividends, acquisitions and general corporate purposes. Our ability to fund these uses of liquidity also will often depend upon where we generate cash, our ability to reinvest in such countries and our ability to repatriate cash into the U.S. Our ability to fund operations and capital needs will depend upon our ongoing ability to generate cash from operations and access the capital markets. We believe that future cash from operations, our Revolving Facility, and access to capital markets will provide adequate resources to meet working capital needs, potential dividends, capital expenditures and strategic investments.

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As of March 31, 2019, the majority of our cash and cash items of \$390.8 million were held outside the U.S. If we elect to repatriate the foreign cash, we may be required to accrue and pay withholding taxes on a portion of these amounts.

On April 12, 2019, the company terminated the merger agreement with Entegris and paid a termination fee of \$140 million pursuant thereto to Entegris.

As of March 31, 2019, we had availability of \$200.0 million under our Revolving Facility and approximately \$19.9 million under our various non-US credit facilities.

As of March 31, 2019, we had \$985.6 million of total debt. Our scheduled principal repayments on debt for our fiscal years include \$2.9 million due in 2019, \$5.8 million due in 2020, \$5.8 million due in 2021, \$5.8 million due in 2022, \$540.3 million due in 2023 and \$425.0 million due thereafter. We were in compliance with all of our debt covenants at March 31, 2019, and we expect to remain in compliance with these covenants for at least the next twelve months.

For a summary of our Senior Credit Facilities and the Notes, see Note 7, "Debt", to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

To take advantage of the continued strong market demand and the opportunity to drive organic growth, we anticipate increasing our capital expenditures in fiscal year 2019. This includes enhancing our research and manufacturing capabilities in key geographies such as Korea and China and improving our cost and capacity positions in certain Materials products.

In connection with the U.S. Tax Act, we recorded a liability of \$52.1 million for the Federal and State taxes on the mandatory deemed repatriation of certain foreign accumulated earnings. Due to taxes on the mandatory deemed repatriation, less certain foreign tax credits, and the available election to pay the federal portion over the eight-year period provided in the U.S. Tax Act, we expect our Federal and State cash taxes for our fiscal years to increase \$7.7 million for 2019, \$3.1 million for 2020, \$3.1 million for 2021, \$3.1 million for 2022, \$3.1 million for 2023 and \$19.8 million thereafter.

CASH FLOWS

Our cash flows provided by (used in) operating, investing, and financing activities as reflected in the consolidated statements of cash flows, are summarized in the following table:

	Six Months Ended March 31,	
	2019	2018
(In millions)		
Operating activities	\$ 73.3	\$ 56.5
Investing activities	(55.7)	(64.1)
Financing activities	(25.1)	(16.6)

Operating Activities

For the six months ended March 31, 2019, cash provided by operating activities was \$73.3 million. Net income attributable to Versum of \$111.5 million is adjusted for reconciling items that include depreciation and amortization, deferred income taxes and share-based compensation expense. Working capital was a use of cash of \$78.5 million. The change in working capital was primarily a result of a decrease in payables and accrued liabilities due to year-end payment of incentive compensation as well as an increase in trade receivables, inventory and contracts in progress less progress billings due to period over period timing differences related to collections, increased purchases of raw materials and the timing of billings.

For the six months ended March 31, 2018, cash provided by operating activities was \$56.5 million. Net income attributable to Versum of \$80.3 million is adjusted for reconciling items that include depreciation and amortization, deferred income taxes, gain on sale of assets and share-based compensation expense. Working capital was a use of cash of \$46.8 million. The change in working capital was primarily a result of a decrease in payables and accrued liabilities due to payment of annual incentive compensation from fiscal year 2017 and prepayment of payables in advance of the SAP implementation as well as an increase in trade receivables and contracts in progress due to increased sales activity and period over period

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timing differences related to collections. This was partially offset by an increase in accrued income taxes of \$39.2 million largely attributable to a charge as a result of the Tax Act.

Investing Activities

For the six months ended March 31, 2019, cash used by investing activities was \$55.7 million primarily due to spending for plant and equipment. For the six months ended March 31, 2018, cash used in investing activities was \$64.1 million primarily due to spending for plant and equipment.

Capital expenditures in the six months ended March 31, 2019 totaled \$45.0 million, including \$0.4 million of capital spending related to one-time restructuring activities, compared to \$65.1 million, including \$26.7 million of capital spending related to one-time restructuring activities in the six months ended March 31, 2018. The decrease in capital expenditures of \$20.1 million for the period was primarily due to lower plant and equipment spending as well as restructuring capital expenditures.

Financing Activities

For the six months ended March 31, 2019, cash used for financing activities was \$25.1 million primarily due to the payment of long-term debt and dividends paid to shareholders. For the six months ended March 31, 2018, cash used for financing activities was \$16.6 million primarily due to the payment of long-term debt and dividends paid to shareholders.

CONTRACTUAL OBLIGATIONS

We are obligated to make future payments under various contracts such as debt agreements, lease agreements, unconditional purchase obligations, and other long-term obligations. There have been no material changes to contractual obligations since September 30, 2018.

LONG-TERM EMPLOYEE BENEFITS

Refer to Note 11, "Retirement Benefits", to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q for further discussion.

OFF-BALANCE SHEET ARRANGEMENTS

As of March 31, 2019, we did not have any off-balance sheet arrangements.

INFLATION

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

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our critical accounting policies are disclosed in our Annual Report on Form 10-K for our fiscal year ended September 30, 2018. During the three months ended March 31, 2019, there have been no significant changes in our critical accounting policies as reported in our 2018 Annual Report on Form 10-K.

NEW ACCOUNTING GUIDANCE

See Note 2, “New Accounting Guidance”, to our Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for information concerning the implementation and impact of new accounting guidance.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

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

We address these financial exposures through a controlled program of risk management that includes the use of derivative financial instruments. Counterparties to all derivative contracts are major financial institutions, thereby minimizing the risk of credit loss. All instruments are entered into for other than trading purposes. For details on the types and use of these derivative instruments, see Note 9, Financial Instruments, to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q, for additional information.

Our derivative and other financial instruments consist of foreign exchange-forward contracts and long-term debt (including current portion). The net market value of these financial instruments combined is referred to below as the net financial instrument position and is disclosed in Note 10, Fair Value, to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

At March 31, 2019, the net financial instrument position was a liability of \$1,007.2 million.

Interest Rate Risk

We have interest rate risk with respect to our long-term debt. Our fixed rate debt consists of senior notes and our variable rate debt consists of term loans under our Term Facility. Changes in interest rates have different impacts on the fixed and variable rate portions of our debt portfolio. A change in interest rates on the fixed portion of the debt portfolio impacts the fair value of the debt instrument but has no impact on interest expense or cash flows. A change in interest rates on the variable portion of the debt portfolio impacts the interest incurred but not the fair value of the instrument.

The sensitivity analysis related to the interest rate risk on the fixed portion of our debt assumes an instantaneous 100 bp move in interest rates from the level at March 31, 2019, with all other variables held constant. A 100 bp increase in market interest rates would result in a decrease of \$21.1 million in the fair value of our fixed rate debt at March 31, 2019.

Based on the variable-rate debt balance at March 31, 2019, a 100 bp increase in interest rates would result in an additional \$5.6 million of interest incurred per year at the end of March 31, 2019.

Foreign Currency Exchange Rate Risk

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

We enter into forward exchange contracts to hedge the cash flow exposure on inter-company loans. The primary currency pairs for which we have exchange rate exposure related to these forward contracts are Japanese Yen and U.S. Dollars as well as Euros and U.S. Dollars. There is fair value exposure related to all of the financial instruments in the below sensitivity

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analysis for which the impact of a movement in exchange rates would be in the opposite direction and materially equal to the impact on the instruments in the analysis.

The sensitivity analysis related to foreign currency exchange rates as they relate to the forward contracts assumes an instantaneous 10% change in the foreign currency exchange rates from their levels at March 31, 2019, with all other variables held constant. A 10% strengthening or weakening of the functional currency of an entity versus all other currencies would result in a decrease or increase, respectively, of \$2.6 million in the net asset position of financial instruments at March 31, 2019.

We also have sales denominated in the South Korean Won, New Taiwan Dollar, Chinese Renmibi, Euro and the Japanese Yen. Approximately 56% of Versum's sales are denominated in these currencies. Financial results therefore will be affected by changes in currency exchange rates. If all foreign currencies were to see a 10% reduction versus the U.S. dollar during the six months ended March 31, 2019, the operating income would be negatively impacted by approximately \$8.8 million.

Item 4. Controls and Procedures.

Management's Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this report, our principal executive officer and principal financial officer evaluated the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) of the Exchange Act), which are designed to provide reasonable assurance that we are able to record, process, summarize and report the information required to be disclosed in our reports under the Exchange Act within the time periods specified in the rules and forms of the SEC. Based on the evaluation, as of March 31, 2019, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective to provide reasonable assurance that the information required to be disclosed in reports that we file or submit under the Exchange Act is accumulated and communicated to management, including our principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosures and to ensure that such information is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms.

Changes in Internal Control over Financial Reporting

During the three months ended March 31, 2019 there were no material changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

Refer to Note 15, “Commitments and Contingencies”, to our Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

Additional information on our commitments and contingencies can be found in our Annual Report on Form 10-K for our fiscal year ended September 30, 2018.

Item 1A. Risk Factors.

In addition to the information set forth in this Quarterly Report on Form 10-Q, you should carefully consider the “Risk Factors” disclosed under “Item 1A. Risk Factors” of our Annual Report on Form 10-K for the fiscal year ended September 30, 2018 filed with the SEC and in any of our subsequently filed Quarterly Reports on Form 10-Q. You should be aware that these risk factors and other information may not describe every risk facing Versum. Other than as set forth below, there have been no material changes to the risk factors set forth in our most recently filed Form 10-K and subsequently filed Form 10-Qs.

There are risks and uncertainties associated with our proposed merger with Merck KGaA

On April 12, 2019, the company announced its entry into an agreement and plan of merger (the “Merger Agreement”) with Merck KGaA, and EMD Performance Materials Holding, Inc. Completion of the proposed merger is subject to various conditions, and the proposed merger may not occur even if we obtain stockholder approval. The Merger Agreement provides that, among other things and subject to the terms and conditions of the Merger Agreement, upon the completion of the merger the company will become a wholly-owned subsidiary of Merck KGaA, Darmstadt, Germany (“Merck KGaA”).

The completion of the proposed merger is subject to certain conditions, including, among others, (i) the adoption of the Merger Agreement by our stockholders; (ii) the expiration or earlier termination of any applicable waiting period, and the receipt of approvals under, domestic and certain foreign antitrust and competition laws; (iii) the absence of governmental restraints or prohibitions preventing the consummation of the proposed merger; and (iv) receipt of clearance from the Committee on Foreign Investment in the United States. The obligation of each of us and Merck KGaA to consummate the proposed merger is also conditioned on, among other things, the truth and correctness of the representations and warranties made by the other party to the extent required under the Merger Agreement on the date of the Merger Agreement and on the closing date (except for any representations and warranties made as of a particular date or period, which representations and warranties must be true and correct to the extent required under the Merger Agreement only as of such particular date or period), and the performance by the other party in all material respects of its obligations under the Merger Agreement. We cannot provide any assurance that these conditions will be met or waived, or that we will be able to successfully consummate the proposed merger as provided for under the Merger Agreement, or at all.

If the proposed merger is not completed, our stock price will likely fall to the extent that the current market price of our common stock reflects an assumption that a transaction will be completed. In addition, we may be required to pay a termination fee of \$235.0 million if the Merger Agreement is terminated under certain circumstances specified in the Merger Agreement.

In this regard, we face risks and uncertainties due both to the pendency of the proposed merger as well as the potential failure to consummate the proposed merger, including:

- the occurrence of any change, event, series or circumstances that could give rise to the termination of the Merger Agreement, including a termination of the Merger Agreement under circumstances that could require us to pay the termination fee to Merck KGaA;
- Merck KGaA’s ability to successfully complete the proposed acquisition of the company in the expected time-frames or at all;
- failure to obtain the required company stockholder vote;
- failure of any of the conditions to the proposed merger to be satisfied;

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- the impact of the proposed merger on revenues, operating costs, customer loss and business disruption (including, without limitation, difficulties in maintaining relationships with employees, customers, clients or suppliers) may be greater than expected;
- the retention of certain key employees at the company;
- risks associated with the disruption of management's attention from ongoing business operations due to the proposed merger;
- risks that the proposed merger and the other transactions contemplated by the Merger Agreement disrupt current plans and operations that may harm the company's business;
- our ability to operate our business in compliance with limitations pursuant to the restrictive covenants set forth in the Merger Agreement;
- the outcome of any legal proceedings related to the proposed merger;
- the impact of the proposed merger on our credit rating;
- the parties' ability to meet expectations regarding the timing and completion of the proposed merger;
- delays in closing, or the failure to close, the proposed merger for any reason;
- delays in obtaining any approvals required for the proposed merger or an inability to obtain them on the terms proposed or on the anticipated schedule;
- the risk that the proposed merger and any announcement relating to the proposed merger could have an adverse effect on our ability to retain and hire key personnel or maintain relationships with customers, suppliers, vendors, or other third parties, standing with regulators, the U.S. government or other governments, or on our operating results and business generally;
- the amount of any costs, fees, expenses, impairments or charges relating to the proposed merger;
- the business, economic and political conditions in the countries in which we operate;
- the impact of indebtedness incurred by Merck KGaA in connection with the proposed merger; and
- the effects of the business combination of the company and Merck KGaA, including the combined company's future financial condition, operating results, strategy and plans.

In addition, we have incurred, and will continue to incur, significant costs, expenses and fees for professional services and other transaction costs in connection with the proposed merger, and these fees and costs are payable by us regardless of whether the proposed merger is consummated.

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Item 6. Exhibits.

Exhibit No	Exhibit
2.1+	Agreement and Plan of Merger, dated as of April 12, 2019, by and among Versum Materials, Inc., Merck KGaA and EMD Performance Materials Holding, Inc. (incorporated by reference to Exhibit 2.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on April 12, 2019)
3.1	Certificate of Designations of Series A Junior Participating Preferred Stock of Versum Materials, Inc. (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on February 28, 2019)
4.1	Rights Agreement, dated as of February 28, 2019, between Versum Materials, Inc. and Broadridge Corporate Issuer Solutions, Inc., as Rights Agent, which includes the Form of Certificate of Designations, the Form of Right Certificate, and the Summary of Rights to Purchase Preferred Shares attached thereto as Exhibits A, B and C, respectively (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on February 28, 2019)
4.2	Amendment No. 1 to Rights Agreement, dated as of March 14, 2019, by and between Versum Materials, Inc. and Broadridge Corporate Issuer Solutions, Inc., as Rights Agent (incorporated by reference to Exhibit 14.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on March 14, 2019)
4.3	Amendment and Termination of Rights Agreement, dated as of April 2, 2019, by and between Versum Materials, Inc. and Broadridge Corporate Issuer Solutions, Inc., as Rights Agent (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on April 2, 2019)
4.4	Certificate of Elimination of Series A Junior Participating Preferred Stock of Versum Materials, Inc. (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on April 2, 2019)
10.1	Second Amendment, dated as of February 8, 2019, among Versum Materials, Inc., as borrower, certain of its subsidiaries party thereto, each lender party thereto, Citibank, N.A., as administrative agent and collateral agent (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on February 13, 2019)
10.2#	Form of Retention Bonus Agreement (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on April 12, 2019)
10.3#	Form of Executive Officer Retention Agreement (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Versum Materials, Inc. filed on March 19, 2019)
31.1*	Certification of Chief Executive Officer of Versum Materials, Inc., Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of Chief Financial Officer of Versum Materials, Inc., Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1†	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to Rule 13a-14(b) of the Exchange Act and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document

+Schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The registrant hereby undertakes to furnish supplementally copies of any of the omitted schedules upon request by the SEC.

*Filed herewith

†Furnished herewith.

#Management contract or compensatory arrangement

The agreements or other documents referenced as exhibits to this report are not intended to provide factual information or disclosure other than with respect to the terms of the agreements or other documents themselves, and you should not

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rely on them for that purpose. In particular, any representations and warranties made by us in these agreements or other documents were made solely within the specific context of the relevant agreement or document and may not describe the actual state of affairs as of the date they were made or at any other time.

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.

VERSUM MATERIALS, INC.

By: /s/ George G. Bitto
George G. Bitto
Executive Vice President and Chief Financial Officer

Date: May 7, 2019

By: /s/ Jessica Feather-Bowman
Jessica Feather-Bowman
Controller and Principal Accounting Officer

Date: May 7, 2019

PRINCIPAL EXECUTIVE OFFICER'S CERTIFICATION

I, Guillermo Novo, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Versum Materials, 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(s) 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(s) 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: May 7, 2019

/s/ Guillermo Novo

Guillermo Novo

President and Chief Executive Officer

PRINCIPAL FINANCIAL OFFICER'S CERTIFICATION

I, George G. Bitto, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Versum Materials, 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(s) 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(s) 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: May 7, 2019

/s/ George G. Bitto

George G. Bitto

Executive Vice President and Chief Financial Officer

**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 Versum Materials, Inc. (the "Company") for the period ended March 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we, Guillermo Novo, President and Chief Executive Officer of the Company, and George G. Bitto, Senior Vice President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 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 the Company.

Dated: May 7, 2019

/s/ Guillermo Novo

Guillermo Novo
President and Chief Executive Officer

/s/ George G. Bitto

George G. Bitto
Executive Vice President and Chief Financial Officer

This statement is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and it is not to be incorporated by reference into any filing of the Company, regardless of any general incorporation language in such filing. A signed original of this written statement required by Section 906 will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.