BROOKS AUTOMATION INC
Form 10-Q
May 03, 2019
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

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 000-25434

BROOKS AUTOMATION, INC.

(Exact name of registrant as specified in its charter)

Delaware	04-3040660
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

15 Elizabeth Drive

Chelmsford, Massachusetts

(Address of principal executive offices)

01824

(Zip Code)

Registrant’s telephone number, including area code: (978) 262-2400

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, $0.01 par value	BRKS	The Nasdaq Stock Market LLC

Indicate the number of shares outstanding of each of the issuer’s classes of common stock, as of the latest practicable date, April 29, 2019: common stock, $0.01 par value and 72,137,250 shares outstanding.

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PART I. FINANCIAL INFORMATION

Item 1. Consolidated Financial Statements

BROOKS AUTOMATION, INC.

CONSOLIDATED BALANCE SHEETS

(unaudited)

(In thousands, except share and per share data)

	March 31, 2019	September 30, 2018
Assets		
Current assets		
Cash and cash equivalents	$ 137,217	$ 197,708
Marketable securities	47	46,281
Accounts receivable, net	163,653	125,192
Inventories	108,512	96,986
Prepaid expenses and other current assets	35,056	31,741
Current assets held for sale	65,005	66,148
Total current assets	509,490	564,056
Property, plant and equipment, net	97,939	59,988
Long-term marketable securities	2,795	7,237
Long-term deferred tax assets	28,012	43,798
Goodwill	492,526	255,876
Intangible assets, net	270,793	99,956
Other assets	23,250	5,294
Non-current assets held for sale	63,072	59,052
Total assets	$ 1,487,877	$ 1,095,257
Liabilities and Stockholders' Equity		
Current liabilities		
Current portion of long term debt	$ 8,114	$ 2,000
Accounts payable	56,934	55,873
Deferred revenue	31,200	25,884
Accrued warranty and retrofit costs	7,202	6,340
Accrued compensation and benefits	24,129	29,322
Accrued restructuring costs	586	659
Accrued income taxes payable	7,276	6,746
Accrued expenses and other current liabilities	36,294	30,405
Current liabilities held for sale	6,595	7,388
Total current liabilities	178,330	164,617
Long-term debt	535,384	194,071
Long-term tax reserves	15,037	1,102
Long-term deferred tax liabilities	15,978	7,135
Long-term pension liabilities	4,717	4,255
Other long-term liabilities	7,997	5,547

Non-current liabilities held for sale	523	698
Total liabilities	757,966	377,425
Commitments and contingencies (Note 16)		
Stockholders' Equity		
Preferred stock, $0.01 par value - 1,000,000 shares authorized, no shares issued or outstanding	—	—
Common stock, $0.01 par value - 125,000,000 shares authorized, 85,593,182 shares issued and 72,131,313 shares outstanding at March 31, 2019, 84,164,130 shares issued and 70,702,261 shares outstanding at September 30, 2018	856	841
Additional paid-in capital	1,909,684	1,898,434
Accumulated other comprehensive income	11,852	13,587
Treasury stock, at cost- 13,461,869 shares	(200,956)	(200,956)
Accumulated deficit	(991,525)	(994,074)
Total stockholders' equity	729,911	717,832
Total liabilities and stockholders' equity	$ 1,487,877	$ 1,095,257

The accompanying notes are an integral part of these unaudited consolidated financial statements.

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

(unaudited)

(In thousands, except per share data)

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Revenue				
Products	$ 128,056	$ 121,031	$ 253,430	$ 226,803
Services	70,334	35,921	124,327	72,748
Total revenue	198,390	156,952	377,757	299,551
Cost of revenue				
Products	77,803	70,635	152,376	134,164
Services	40,071	23,931	72,785	48,742
Total cost of revenue	117,874	94,566	225,161	182,906
Gross profit	80,516	62,386	152,596	116,645
Operating expenses				
Research and development	14,101	11,347	27,249	22,752
Selling, general and administrative	52,373	40,671	105,914	78,599
Restructuring charges	370	47	429	48
Total operating expenses	66,844	52,065	133,592	101,399
Operating income	13,672	10,321	19,004	15,246
Interest income	316	356	739	504
Interest expense	(8,018)	(2,196)	(13,308)	(4,377)
Loss on extinguishment of debt	(9,051)	—	(9,051)	—
Other expenses, net	(778)	(515)	(807)	(2,438)
Income (loss) before income taxes	(3,859)	7,966	(3,423)	8,935
Income tax benefit	(1,030)	(54,531)	(6,860)	(55,181)
Income (loss) from continuing operations	(2,829)	62,497	3,437	64,116
Income from discontinued operations, net of tax	6,250	4,523	14,399	19,390
Net income	$ 3,421	$ 67,020	$ 17,836	$ 83,506
Basic net income per share attributable to Brooks Automation, Inc. common stockholders:				
Income (loss) from continuing operations	$ (0.04)	$ 0.89	$ 0.05	$ 0.91
Income from discontinued operations, net of tax	0.09	0.06	0.20	0.28
Basic net income per share	$ 0.05	$ 0.95	$ 0.25	$ 1.19
Diluted net income per share attributable to Brooks Automation, Inc. common stockholders:				
Income (loss) from continuing operations	$ (0.04)	$ 0.89	$ 0.05	$ 0.90
Income from discontinued operations, net of tax	0.09	0.06	0.20	0.27
Diluted net income per share	$ 0.05	$ 0.95	$ 0.25	$ 1.18
Weighted average shares used in computing net income per share:				

Basic	72,077	70,220	71,760	70,340
Diluted	72,292	70,613	72,215	70,908

The accompanying notes are an integral part of these unaudited consolidated financial statements.

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(unaudited)

(In thousands)

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Net income	$ 3,421	$ 67,020	$ 17,836	$ 83,506
Other comprehensive income (loss), net of tax:				
Cumulative foreign currency translation adjustments	(3,513)	5,154	(1,836)	9,287
Unrealized gains (losses) on marketable securities, net of tax effects of $0 during each of the three and six months ended March 31, 2019, and $0 during each of the three and six months ended March 31, 2018	232	—	111	—
Actuarial gains (losses), net of tax effects of $0 and $3 during the three and six months ended March 31, 2019, $0 and ($2) during the three and six months ended March 31, 2018	(1)	6	(10)	(3)
Total other comprehensive income (loss), net of tax	(3,282)	5,160	(1,735)	9,284
Comprehensive income (loss)	$ 139	$ 72,180	$ 16,101	$ 92,790

The accompanying notes are an integral part of these unaudited consolidated financial statements.

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(unaudited)

(In thousands)

	Six Months Ended March 31,	
	2019	2018
Cash flows from operating activities		
Net income	$ 17,836	$ 83,506
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	26,339	17,634
Stock-based compensation	9,717	10,129
Amortization of premium on marketable securities and deferred financing costs	556	217
Earnings of equity method investments	(3,041)	(3,602)
Loss recovery on insurance claim	—	(1,103)
Deferred income tax benefit	(12,472)	(49,156)
Loss on extinguishment of debt	9,051	—
Other gains on disposals of assets	34	—
Changes in operating assets and liabilities, net of acquisitions:		
Accounts receivable	(9,654)	(16,949)
Inventories	(9,992)	(16,233)
Prepaid expenses and other assets	1,938	(17,248)
Accounts payable	(6,088)	14,899
Deferred revenue	5,410	(2,783)
Accrued warranty and retrofit costs	740	(16)
Accrued compensation and tax withholdings	(11,123)	(4,151)
Accrued restructuring costs	(57)	(1,336)
Proceeds from recovery on insurance claim	886	—
Accrued expenses and other liabilities	2,149	9,619
Net cash provided by operating activities	22,229	23,427
Cash flows from investing activities		
Purchases of property, plant and equipment	(9,676)	(5,675)
Purchases of marketable securities	(1,290)	(49,560)
Sales of marketable securities	48,904	—
Maturities of marketable securities	2,557	100
Acquisitions, net of cash acquired	(442,704)	(64,988)
Proceeds from sales of property, plant and equipment	—	200
Net cash used in investing activities	(402,209)	(119,923)
Cash flows from financing activities		
Proceeds from term loans, net of discount	686,386	197,554
Proceeds from issuance of common stock	1,548	1,395
Payment of financing costs	(687)	(318)

Principal payments on debt	(352,289)	(500)
Payment of capital lease	(487)	—
Common stock dividends paid	(14,429)	(14,125)
Net cash provided by financing activities	320,042	184,006
Effects of exchange rate changes on cash and cash equivalents	(553)	4,884
Net increase (decrease) in cash and cash equivalents	(60,491)	92,394
Cash and cash equivalents, beginning of period	197,708	101,622
Cash and cash equivalents, end of period	$ 137,217	$ 194,016
Supplemental disclosure of non-cash investing and financing activities:		
Purchases of property, plant and equipment included in accounts payable	$ 1,670	$ 716

The accompanying notes are an integral part of these unaudited consolidated financial statements.

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(unaudited)

(In thousands, except share data)

	Common Stock Shares	Common Stock at Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income	Accumulated Deficit	Treasury Stock	Total Equity
	(In thousands, except share data)						
Balance September 30, 2017	83,294,848	$ 833	$ 1,874,918	$ 15,213	$ (1,082,364)	$ (200,956)	$ 607,644
Shares issued under restricted stock and purchase plans, net	706,877	7	1,388				1,395
Stock-based compensation			10,129				10,129
Common stock dividends declared, at $0.20 per share					(14,125)		(14,125)
Foreign currency translation adjustments				9,287			9,287
Actuarial losses, net of tax effects of ($2)				(3)			(3)
Net income					83,506		83,506
Balance March 31, 2018	84,001,725	$ 840	$ 1,886,435	$ 24,497	$ (1,012,983)	$ (200,956)	$ 697,833
Balance September 30, 2018	84,164,130	$ 841	$ 1,898,434	$ 13,587	$ (994,074)	$ (200,956)	$ 717,832
Shares issued under restricted stock and purchase plans, net	1,429,052	15	1,533				1,548
Stock-based compensation			9,717				9,717
Common stock dividends declared, at $0.20 per share					(14,428)		(14,428)
Foreign currency translation adjustments				(1,836)			(1,836)
				111			111

Changes in unrealized losses on marketable securities, net of tax effects of $0							
Actuarial losses, net of tax effects of $3				(10)			(10)
ASC 606 adjustment				—	(859)		(859)
Net income					17,836		17,836
Balance March 31, 2019	85,593,182	$ 856	$ 1,909,684	$ 11,852	$ (991,525)	$ (200,956)	$ 729,911

The accompanying notes are an integral part of these unaudited consolidated financial statements.

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BROOKS AUTOMATION, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (unaudited)

1. Basis of Presentation

The unaudited consolidated financial statements of Brooks Automation, Inc. and its subsidiaries (“Brooks”, or the “Company”) included herein have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP"). All intercompany accounts and transactions have been eliminated in consolidation. In the opinion of management, all material adjustments, which are of a normal and recurring nature and necessary for a fair statement of the financial position and results of operations and cash flows for the periods presented, have been reflected in the accompanying unaudited consolidated financial statements. The results of operations for the interim periods are not necessarily indicative of the results of operations to be expected for the full fiscal year.

Discontinued Operations

In the fourth quarter of fiscal year 2018, the Company entered into a definitive agreement to sell its semiconductor cryogenics business to Edwards Vacuum LLC (a member of the Atlas Copco Group), (the “Disposition”). The Company determined that the cryogenics business met the “held for sale” criteria and the “discontinued operations” criteria in accordance with Financial Accounting Standard Boards (“FASB”) Accounting Standards Codification (“ASC”) 205, Presentation of Financial Statements, (“FASB ASC 205”) as of September 30, 2018. The Consolidated Balance Sheets and Consolidated Statements of Operations, and the notes to the Consolidated Financial Statements were restated for all periods presented to reflect the discontinuation of the cryogenics business, in accordance with FASB ASC 205. The discussion in the notes to these Consolidated Financial Statements, unless otherwise noted, relate solely to the Company's continuing operations. Please refer to Note 3, “Discontinued Operations” for further information.

Certain information and footnote disclosures normally included in the Company’s annual consolidated financial statements have been condensed or omitted and, accordingly, the accompanying financial information should be read in conjunction with the audited consolidated financial statements and notes thereto contained in the Company’s Annual Report on Form 10 K filed with the United States Securities and Exchange Commission (the “SEC”) for the fiscal year ended September 30, 2018 (the "2018 Annual Report on Form 10 K"). The accompanying Consolidated Balance Sheet as of September 30, 2018 was derived from the audited annual consolidated financial statements as of the period then ended.

Revision of Prior Period Financial Statements

During the three months ended March 31, 2019, the Company identified a misclassification related to the presentation of the product and service revenue and the cost of product and service revenue related to GENEWIZ in the Company's Consolidated Statements of Operations for the three months ended December 31, 2018. The total revenue and cost of revenue related to GENEWIZ for the three months ended December 31, 2018 were included in the product revenue and cost of revenue line items instead of the service revenue and cost of revenue line items in the Consolidated Statements of Operations in the Form 10-Q for the quarter ended December 31, 2018. GENEWIZ was acquired during the three months ended December 31, 2018 and therefore the misclassifiation did not impact any other historical periods. The misclassification had no impact on total revenue or the total cost of revenue, gross profit, operating income (loss), net income (loss), as well as basic and diluted net income (loss) per share during any of the periods presented. Additionally, the misclassification had no impact on the Company's consolidated balance sheets and consolidated statements of cash flows during any of the prior periods. The Company considered the guidance in Accounting Standard Codification (ASC) Topic 250, “Accounting Changes and Error Corrections,” ASC Topic 250-10-S99-1, “Assessing Materiality,” and ASC Topic 250-10-S99-2, “Considering the Effects of Prior Year

Misstatements when Quantifying Misstatements in Current Year Financial Statements" in evaluating whether the Company’s previously issued consolidated financial statements were materially misstated. The Company concluded this misclassification was not material individually or in the aggregate to the financial statements presented for the three months ended December 31, 2018, and therefore, amendments of the previously filed Form 10-Q for the three months ended December 31, 2018 was not required. The revision for this correction to the three months ended December 31, 2018 is reflected in the reported

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revenue and cost of revenue classification for the six months ended March 31, 2019 in this report and will be corrected in any future filings containing such financial information for the three months ended December 31, 2018.

The following table summarizes the effects of the misclassification to the three months ended December 31, 2018:

	Three Months Ended December 31, 2018		
Dollars in thousands	As Previously Reported	Adjustment	As Revised
Total Company			
Revenue			
Products	$ 141,732	$ (16,357)	$ 125,375
Service	37,636	16,357	53,993
Total Revenue	179,368	—	179,368
Cost of revenue			
Products	83,481	(8,907)	74,574
Service	23,806	8,907	32,713
Total cost of revenue	$ 107,287	$ —	$ 107,287
Brooks Life Science Segment			
Revenue			
Products	$ 39,931	$ (16,357)	$ 23,574
Service	26,730	16,357	43,087
Total Revenue	$ 66,661	$ —	$ 66,661

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of unaudited consolidated financial statements in conformity with GAAP requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the unaudited consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. Significant estimates are associated with accounts receivable, inventories, goodwill, intangible assets other than goodwill, long-lived assets, derivative financial instruments, deferred income taxes, warranty obligations, revenue recognized on an over time method, pension obligations and stock-based compensation expense. The Company bases its estimates on historical experience and various other assumptions, including in certain circumstances future projections that management believes to be reasonable under the circumstances. Although the Company regularly assesses these estimates, actual results could differ from those estimates. Changes in estimates are recorded in the period in which they occur and become known.

Foreign Currency Translation

Certain transactions of the Company and its subsidiaries are denominated in currencies other than their functional currency.

Foreign currency exchange losses generated from the settlement and remeasurement of these transactions are recognized in earnings and presented within “Other expenses, net” in the Company’s unaudited Consolidated Statements of Operations. Net foreign currency transaction and remeasurement losses totaled $0.6 million and $0.5 million, respectively, during the three months ended March 31, 2019 and 2018 and $0.6 million and $2.5 million, respectively, during the six months ended March 31, 2019 and 2018.

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Derivative Instruments

The Company has transactions and balances denominated in currencies other than the U.S. dollar. Most of these transactions or balances are denominated in Euros, British Pounds and a variety of Asian currencies. The Company enters into foreign exchange contracts to reduce its exposure to currency fluctuations. The forward contract arrangements that the Company enters into, typically mature in three months or less. These transactions do not qualify for hedge accounting. Net gains and losses related to these contracts are recorded as a component of "Other expenses, net" in the accompanying unaudited Consolidated Statements of Operations and are as follows for the three and six months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Realized losses on derivatives not designated as hedging instruments	$ (3,831)	$ (4,548)	$ (854)	$ (6,221)

The fair values of the forward contracts are recorded in the Company’s accompanying unaudited Consolidated Balance Sheets as "Prepaid expenses and other current assets" and "Accrued expenses and other current liabilities". Foreign exchange contract assets and liabilities are measured and reported at fair value based on observable market inputs and classified within Level 2 of the fair value hierarchy described below due to a lack of an active market for these contracts.

Fair Value Measurements

The Company measures at fair value certain financial assets and liabilities, including cash equivalents and available for sale securities. FASB ASC 820, Fair Value Measurement and Disclosures, establishes a fair value hierarchy that requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The following levels of inputs may be used to measure fair value:

Level 1 Inputs: Quoted prices in active markets for identical assets or liabilities as of the reporting date. Active markets are those in which transactions for the asset and liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2 Inputs: Observable inputs other than prices included in Level 1, including quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3 Inputs: Unobservable inputs that are significant to the fair value of the assets or liabilities and reflect an entity’s own assumptions in pricing assets or liabilities since they are supported by little or no market activity.

As of March 31, 2019, the Company had no assets or liabilities measured and recorded at fair value on a recurring basis using Level 3 inputs.

Recently Issued Accounting Pronouncements

In March 2019, the Financial Accounting Standards Board (“FASB”) issued ASU 2019-01 “Leases (Topic 842) - Codification Improvements”, which makes targeted changes to lessor accounting and clarifies interim transition

disclosure requirements. The targeted changes to the lessor accounting are not applicable to the Company because we are not in the industry to be targeted by the guidance. The ASU clarifies that companies are exempt from making the interim period transition disclosures required by ASC 250, Accounting Changes and Error Corrections, for the period in which a change in accounting principle is made as a result of adopting ASC 842. This interim period disclosure exemption is consistent with ASC 842, which already allowed companies to exclude the annual effect of the accounting change on income from continuing operations, net income and per-share amounts for periods post-adoption. This ASU is effective for fiscal years ending after December 15, 2018 and interim periods within those fiscal years. Early adoption is permitted. The Company is currently evaluating the impact of this ASU.

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In December 2018, the Financial Accounting Standard Board ("FASB") issued ASU 2018-20 "Leases (Topic 842): Narrow-Scope Improvements for Lessors". The amendments create a lessor practical expedient applicable to sales and other similar taxes incurred in connection with a lease and simplify lessor accounting for lessor costs paid by the lessee. The ASU permits lessors to present sales and other similar taxes that arise from a specific leasing transaction on a net basis. It requires lessors to present lessor costs paid by the lessee directly to a third party on a net basis – regardless of whether the lessor knows, can determine or can reliably estimate those costs. It requires lessors to present lessor costs paid by the lessee to the lessor on a gross basis. It clarifies that lessors should recognize variable payments allocable to non-lease components as revenue in accordance with relevant other guidance. The effective date coincides with the effective date of the new leases standard for companies that have not early adopted. As such, this ASU is effective for fiscal years ending after December 15, 2018 and interim periods within those fiscal years. Early adoption is permitted. The Company is currently evaluating the impact of this ASU.

In August 2018, the Financial Accounting Standard Board ("FASB") issued ASU 2018-15, "Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract". The amendments align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by these amendments. The provisions may be adopted prospectively or retrospectively. This ASU is effective for annual periods, including interim periods within those annual periods, beginning after December 15, 2019. Early adoption is permitted. The Company is currently evaluating the impact of this ASU.

In August 2018, the FASB issued ASU 2018-14, Disclosure Framework — Changes to the Disclosure Requirements for Defined Benefit Plans, which amends ASC 715 to add, remove, and clarify disclosure requirements related to defined benefit pension and other postretirement plans. The amendments require additional disclosure for the weighted-average interest crediting rates, a narrative description of the reasons for significant gains and losses, and an explanation of any other significant changes in the benefit obligation or plan assets. The amendment removes disclosure requirement for accumulated other comprehensive income expected to be recognized over the next year, information about plan assets to be returned to the entity, and the effects of a one-percentage-point change on the assumed health care costs and the effect of this change in rates on service cost, interest cost, and the benefit obligation for postretirement health care benefits. The ASU is effective for fiscal years ending after December 15, 2020. Early adoption is permitted. The ASU does not amend the interim disclosure requirements of ASC 715-20. The Company is currently evaluating the impact of this ASU.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement, which amends ASC 820 to add and remove disclosure requirements related to fair value measurement. The amendments include new disclosure requirement for changes in unrealized gains or losses included in other comprehensive income (OCI) for recurring Level 3 fair value measurements held at the end of the reporting period and the range and weighted average used to develop significant unobservable inputs for Level 3 fair value measurements. The amendments eliminated disclosure requirements for amount of and reasons for transfers between Level 1 and Level 2, valuation processes for Level 3 fair value measurements, and policy for timing of transfers between levels of the fair value hierarchy. In addition, the amendments modified certain disclosure requirement to provide clarification or to promote appropriate exercise of discretion by entities. ASU 2018-13 is effective for fiscal years beginning after December 15, 2019, including interim periods therein. Early adoption is permitted. The Company is currently evaluating the impact of this ASU.

In March 2018, the FASB issued ASU 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income, which amends ASC 220 to add, remove, and clarify disclosure requirements related to reporting comprehensive income. This ASU gives entities the option to reclassify tax effects recorded in accumulated

other comprehensive income as a result of tax reform to retained earnings. The entities have the option to apply the guidance retrospectively or in the period of adoption. The guidance requires entities to make new disclosures, regardless of whether they elect to reclassify tax effects. The guidance is effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. Early adoption in any period is permitted. The Company expects to adopt

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the guidance during the first quarter of fiscal year 2020 and is evaluating the effect that ASU 2018-02 will have on its consolidated financial statements and related disclosures.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments—Credit Losses (Topic 326), which amends ASC 326 to add, remove, and clarify disclosure requirements related to credit losses of financial instruments. The new guidance introduces a new "expected loss" impairment model which applies to most financial assets measured at amortized cost and certain other instruments, including trade and other receivables, loans, held-to-maturity debt securities and other financial assets. Entities are required to estimate expected credit losses over the life of financial assets and record an allowance against the assets' amortized cost basis to present them at the amount expected to be collected. Additionally, the guidance amends the impairment model for available for sale debt securities and requires entities to determine whether all or a portion of the unrealized loss on such debt security is a credit loss. The guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2019. Early adoption of the newly issued guidance is permitted for fiscal years, and interim periods within those years, beginning after December 15, 2018. The standard should be applied as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective. The Company expects to adopt the guidance during the first quarter of fiscal year 2021 and is currently evaluating the impact of this guidance on its financial position and results of operations.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), an amendment of the FASB ASC. In accordance with the provisions of the newly issued guidance, a lessee should recognize at the inception of the arrangement a right-of-use asset and a corresponding lease liability initially measured at the present value of lease payments over the lease term. For finance leases, interest on a lease liability should be recognized separately from the amortization of the right-of-use asset, while for operating leases, total lease costs are recorded on a straight-line basis over the lease term. For leases with a term of twelve months or less, a lessee is permitted to make an accounting policy election by class of underlying assets to forgo a recognition of right-of-use assets and corresponding lease liabilities and record a lease expense on a straight-line basis. Entities should determine at the inception of the arrangement whether a contract represents a lease or contains a lease which is defined as a right to control the use of identified property for a period of time in exchange for consideration. Additionally, entities should separate the lease components from the non-lease components and allocate the contract consideration on a relative standalone price basis in accordance with provisions of ASC Topic 606, Revenue from Contracts with Customers. The guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018 and should be adopted via a modified retrospective approach with certain optional practical expedients that entities may elect to apply. The Company expects to adopt the guidance during the first quarter of fiscal year 2020 and is currently evaluating the impact of this guidance on its financial position and results of operations.

Recently Adopted Accounting Pronouncements

In May 2014, the FASB issued new accounting guidance for reporting revenue recognition, ASC 606 Revenue from Contracts with Customers ("ASC 606"). The guidance provides for the recognition of revenue when promised goods or services are transferred to customers in an amount that reflects the consideration that is expected to be received for those goods or services. In addition, the guidance requires disclosure of the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. The guidance also specifies the accounting for certain costs to obtain and fulfill a contract, as codified in ASC 340-40 Accounting for Other Assets and Deferred Costs ("ASC 340-40").

The Company adopted this standard effective October 1, 2018, using the modified retrospective method and has only applied this method to contracts that were not completed as of the effective date and all new contracts initiated on or after the effective date. Results for reporting periods beginning on or after October 1, 2018 are presented under ASC 606, while prior period amounts have not been restated and continue to be reported in accordance with the governing

revenue recognition standards applicable to that period.

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The impact of the cumulative effect of adopting ASC 606 effective October 1, 2018 on the Company's Consolidated Balance Sheet is as follows:

	As Reported September 30, 2018	Impact of Adopting ASC 606	As Adopted October 1, 2018
Prepaid expenses and other current assets	$ 31,741	$ 350	$ 32,091
Prepaid expenses and other current assets - discontinued operations	343	235	578
Other assets	5,294	1,483	6,777
Long-term deferred tax assets	43,798	403	44,201
Deferred revenue	25,884	2,850	28,734
Deferred revenue - discontinued operations	1,052	480	1,532
Accumulated deficit	(994,074)	(859)	(994,933)

Upon adoption the Company recorded a cumulative effect adjustment of $0.9 million, net of tax adjustment of $0.4 million, which resulted in an increase to the opening accumulated deficit balance on the Consolidated Balance Sheet, primarily driven by deferral of previously recognized revenue within the Brooks Life Sciences segment, offset by deferral of previously recognized commission expense within the Brooks Life Sciences segment and acceleration of revenue within the Brooks Semiconductor Solutions Group segment.

A portion of the adjustment related to the acceleration of revenue within the Brooks Semiconductor Solutions Group segment results from the change in the revenue recognition rules. Upon the adoption of ASC 606, the Company is no longer required to defer revenue in accordance with billing constraints defined in the contract with the customer. The change impacted the Company's semiconductor contamination control solutions revenue stream as under this new guidance, the Company recognizes revenue in an amount equivalent to the transfer of control that has occurred. (Please refer to Note 13, "Revenue" for further information on when control is transferred). As a result, revenue previously deferred due to the contractual billing restraints that otherwise met the revenue recognition requirements was accelerated into the opening accumulated deficit balance resulting in an increase to accumulated deficit of $0.9 million as of October 1, 2018.

A portion of the adjustment related to the deferral of previously recognized revenue within the Brooks Life Science segment related to fees associated with registration of biological samples. This adjustment is derived from the new requirement to recognize revenue associated with certain sample life cycle management solutions transactions over time under ASC 606, while historically these transactions have been recorded at a point in time. Registration fees for these samples were previously recognized as revenue at a point in time upon completion of the registration and are now required to be recognized ratably over the period of benefit under ASC 606. As a result, upon adopting the standard the Company deferred previously recognized registration fee revenue for contracts not completed as of the effective date. The period of benefit associated with registration fees has been determined to be approximately 24

months resulting in the deferral of revenue historically recognized at a point in time over this period. This change resulted in a decrease to accumulated deficit of $3.1 million as of October 1, 2018.

A portion of the adjustment is related to the deferral of previously recognized commission expense within the Brooks Life Science segment. This portion of the adjustment is derived from the new requirement to recognize the cost to obtain certain transactions over time under ASC 340-40, while historically this expense has been recognized at a point in time. The standard requires certain costs incurred to obtain a contract to be recorded as an asset when incurred and expensed as the transfer of control of the underlying performance obligations occur or over the estimated customer life, depending on the nature of the underlying contract. As a result, upon adopting the standard the Company deferred previously recognized costs for contracts not completed as of the effective date. The estimated customer life has been determined to be approximately 60 months resulting in the deferral of costs historically expensed at a point in time over this period. This change resulted in an increase to accumulated deficit of $1.5 million as of October 1, 2018.

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Additional changes to the Company's accumulated deficit were made as the result of adopting ASC 606. These changes, which resulted in a cumulative decrease to accumulated deficit of $0.2 million as of October 1, 2018, were driven by the identification of additional performance obligations as well as changes in the transfer of control of certain performance obligations across both the Brooks Semiconductor Solutions Group and Brooks Life Science segments. The additional changes to the Company's accumulated deficit included a cumulative decrease to accumulated deficit of $0.2 million from discontinued operations.

As the Company has adopted ASC 606 using the modified retrospective method, the standard requires disclosure of impact from adoption of the standard to each financial statement line item in the current reporting period. The impact of adoption of ASC 606 on the Company's Consolidated Statement of Operations and Consolidated Balance sheet was as follows:

	Three Months Ended March 31, 2019		
	As Reported	Without adoption of ASC 606	Effect of Change Higher/(Lower)
Revenue	$ 198,390	$ 199,555	$ (1,165)
Cost of revenue	117,874	118,372	(498)
Gross profit	80,516	81,183	(667)
Operating expenses	66,844	66,651	193
Operating income	$ 13,672	$ 14,532	$ (860)

	Six Months Ended March 31, 2019		
	As Reported	Without adoption of ASC 606	Effect of Change Higher/(Lower)
Revenue	$ 377,757	$ 379,323	$ (1,566)
Cost of revenue	225,161	226,171	(1,010)
Gross profit	152,596	153,152	(556)
Operating expenses	133,592	133,195	397
Operating income	$ 19,004	$ 19,957	$ (953)

	March 31, 2019		
	As Reported	Without adoption of ASC 606	Effect of Change Higher/(Lower)
Prepaid expenses and other current assets	$ 35,056	$ 31,141	$ 3,915

Other assets	23,250	22,163	1,087
Deferred revenue	31,200	28,328	2,872
Accumulated deficit	(991,525)	(993,655)	2,130

The difference between the reported results and the results without the adoption of ASC 606 was primarily driven from the elimination of revenue constraints due to billing limitations that resulted in acceleration of revenue within the Brooks Semiconductor Solutions Group segment and the deferral of fees associated with the registration of biological samples within the Brooks Life Science segment. Amortization of costs to obtain a contract capitalized through the cumulative effect adjustment described above have resulted in additional expense in the current period under ASC 606. Except as disclosed above, the adoption of ASC 606 did not have a significant impact on the Company’s Consolidated Statement of Operations for the three and six months ended March 31, 2019 and Consolidated Balance Sheet as of March 31, 2019.

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Other

For further information with regard to the Company’s significant accounting policies, please refer to Note 2 "Summary of Significant Accounting Policies" to the Company’s consolidated financial statements included in the 2018 Annual Report on Form 10 K.

3. Discontinued Operations

On August 27, 2018, the Company entered into a definitive agreement to sell its semiconductor cryogenics business to Edwards Vacuum LLC (a member of the Atlas Copco Group) for $675.0 million in cash. The purchase price is subject to adjustments for working capital and other items. The Company anticipates closing of the transaction in the third fiscal quarter of 2019 upon satisfaction of various closing conditions and regulatory approvals.

The semiconductor cryogenics business consists of the CTI pump business, Polycold chiller business, the related services business and the Company's 50% share in Ulvac Cryogenics, Inc., a joint venture based in Japan. The semiconductor cryogenics business was originally acquired by the Company in its 2005 merger with Helix Technology Corporation and is included in the Brooks Semiconductor Solutions Group segment as part of the segment.

In connection with the Disposition, the Company and Edwards have agreed to enter into a transition service agreement, a supply agreement, and lease agreements. The transition service agreement outlines the information technology, people, and facility support the Company expects to provide to Edwards for a period up to 9 months after transaction closing date. The supply agreement allows the Company to purchase CTI and Polycold goods at cost from Edwards up to an aggregate amount equal to $1.0 million during the one-year term after closing of the Disposition. The lease agreements will provide facility space to Edwards free of charge for three years after the transaction closing date. Edwards will have the option to renew each lease at the then current market rates after the initial three-year lease term has ended. This Disposition is consistent with the Company’s long-standing strategy to increase shareholder value by accelerating the growth of its Life Sciences business with further acquisitions and strengthening its semiconductor automation business with opportunistic acquisitions.

The Disposition met the "held for sale" criteria and the “discontinued operation” criteria in accordance with FASB ASC 205 as of September 30, 2018. As such, its operating results have been reported as a discontinued operation for all periods presented.

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The following table presents the financial results of discontinued operations (in thousands):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Revenue				
Products	$ 23,895	$ 39,460	$ 52,681	$ 75,872
Services	11,759	10,848	22,297	21,165
Total revenue	35,654	50,308	74,978	97,037
Cost of revenue				
Products	15,182	22,499	31,698	43,147
Services	6,678	5,510	12,727	10,635
Total cost of revenue	21,860	28,009	44,425	53,782
Gross profit	13,794	22,299	30,553	43,255
Operating expenses				
Research and development	2,168	1,620	4,326	3,414
Selling, general and administrative	4,993	7,180	12,196	10,427
Restructuring charges	-	2	-	2
Total operating expenses	7,161	8,802	16,522	13,843
Operating income	6,633	13,497	14,031	29,412
Other income, net	278	255	567	527
Income before income taxes and earnings of equity method investment	6,911	13,752	14,598	29,939
Income tax provision	1,930	10,651	3,240	14,151
Income before equity in earnings of equity method investment	4,981	3,101	11,358	15,788
Equity in earnings of equity method investment	1,269	1,422	3,041	3,602
Net income	$ 6,250	$ 4,523	$ 14,399	$ 19,390

The table above reflects revenue for the three and six months ended March 31, 2019 in accordance with ASC 606, while results for the three and six months ended March 31, 2018 have not been restated and are reported in accordance with the governing revenue recognition standards applicable to that period. Results for the three and six months ended March 31, 2019 were not significantly impacted by the adoption of ASC 606.

The Company performed its annual goodwill impairment analysis in April 2018. This analysis was updated upon announcement of the Disposition for the year ended September 30, 2018. The Company has concluded that there is no impairment indicator related to the goodwill of the Disposition group at either date the impairment analysis was performed.

The following table presents the summarized financial information for Ulvac Cryogenics, Inc., the unconsolidated subsidiaries accounted for based on the equity method (in thousands):

	March 31, 2019	September 30, 2018
Balance Sheets:		

Current assets	$ 70,071	$ 69,302
Non-current assets	21,409	21,338
Current liabilities	27,168	26,006
Non-current liabilities	8,227	8,397

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	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Statements of Operations:				
Total revenue	$ 22,756	$ 23,106	$ 45,050	$ 45,979
Gross profit	8,305	8,879	17,241	18,112
Operating Income	4,078	4,690	9,214	10,046
Net income	2,602	2,738	6,108	7,052

The following table presents the significant non-cash items and capital expenditures for the discontinued operations that are included in the Consolidated Statements of Cash Flows (in thousands):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Depreciation and amortization	$ -	$ 196	$ -	$ 391
Capital expenditures	99	46	407	72
Stock-based compensation	129	246	420	492
Earnings of equity method investment	(1,269)	(1,422)	(3,041)	(3,602)

The carrying value of the assets and liabilities of the discontinued operations on the Consolidated Balance Sheet as of March 31, 2019 and September 30, 2018 were as follows (in thousands). Balances as of March 31, 2019 are presented under ASC 606, while balances as of September 30, 2018 have not been restated and are reported in accordance with the governing revenue recognition standards applicable to that period. The carrying value of the assets and liabilities associated with discontinued operations as of March 31, 2019 was not significantly impacted by the adoption of ASC 606:

	March 31, 2019	September 30, 2018
Assets		
Accounts receivable, net	$ 25,675	$ 27,852
Inventories	39,280	37,953
Other current assets	50	343
Total current assets of discontinued operation	$ 65,005	$ 66,148
Property, plant and equipment, net	$ 1,499	$ 1,081
Goodwill	26,485	26,485
Intangibles, net	15	14
Equity method investment	35,055	31,472
Other assets	18	-
Total long-term assets of discontinued operation	$ 63,072	$ 59,052
Liabilities		

Deferred revenue	$ 1,082	$ 1,052
Accrued warranty and retrofit costs	2,303	2,464
Accrued compensation and benefits	2,839	3,648
Other current liabilities	371	224
Total current liabilities of discontinued operation	$ 6,595	$ 7,388
Long-term liabilities of discontinued operation	$ 523	$ 698

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4. Marketable Securities

The Company invests in marketable securities that are classified as available-for-sale and records them at fair value in the Company's unaudited Consolidated Balance Sheets. Marketable securities reported as current assets represent investments that mature within one year from the balance sheet date. Long-term marketable securities represent investments with maturity dates greater than one year from the balance sheet date. The securities are valued using matrix pricing and benchmarking and classified within Level 2 of the fair value hierarchy because they are not actively traded. Matrix pricing is a mathematical technique used to value securities by relying on the securities' relationship to other benchmark quoted prices.

Unrealized gains and losses are excluded from earnings and reported as a separate component of accumulated other comprehensive income until the security is sold or matures. Gains or losses realized from sales of marketable securities are computed based on the specific identification method and recognized as a component of "Other expenses, net" in the accompanying unaudited Consolidated Statements of Operations. There were no sales of marketable securities during the three months ended March 31, 2019 and 2018. There were no sales of marketable securities during the six months ended March 31, 2018. During the six months ended March 31, 2019, the Company sold marketable securities with a fair value and amortized cost of $49.4 million and $49.5 million, respectively, and recognized net losses of $0.1 million. As a result, during this period, the Company collected cash proceeds of $48.9 million from the sale of marketable securities and reclassified net unrealized holding losses of $0.1 million from accumulated other comprehensive income into "Other expenses, net" in the accompanying unaudited Consolidated Statements of Operations as a result of these transactions.

The following is a summary of the amortized cost and the fair value, including accrued interest receivable and unrealized holding gains (losses) on the short-term and long-term marketable securities as of March 31, 2019 and September 30, 2018 (in thousands):

	Amortized Cost	Gross Unrealized Losses	Gross Unrealized Gains	Fair Value
March 31, 2019:				
Bank certificates of deposits	$ 2	$ —	$ —	$ 2
Corporate securities	2,795	—	—	2,795
Other debt securities	45			45
	$ 2,842	$ —	$ —	$ 2,842
September 30, 2018:				
U.S. Treasury securities and obligations of U.S. government agencies	$ 30,142	$ (65)	$ —	$ 30,077
Bank certificates of deposits	5,148	—	1	5,149
Corporate securities	14,763	(30)	—	14,733
Municipal securities	2,797	(17)	—	2,780
Other debt securities	779	—	—	779
	$ 53,629	$ (112)	$ 1	$ 53,518

The fair values of the marketable securities by contractual maturities at March 31, 2019 are presented below (in thousands):

	Fair Value
Due in one year or less	$ 47
Due after one year through five years	—
Due after five years through ten years	—
Due after ten years	2,795
Total marketable securities	$ 2,842

Expected maturities could differ from contractual maturities because the security issuers may have the right to prepay obligations without prepayment penalties.

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The Company reviews the marketable securities for impairment at each reporting period to determine if any of the securities have experienced an other-than-temporary decline in fair value. The Company considers factors, such as the length of time and extent to which the market value has been less than the cost, the financial condition and near-term prospects of the issuer, the Company's intent to sell, or whether it is more likely than not it will be required to sell the investment before recovery of its amortized cost basis. If the Company believes that an other-than-temporary decline in fair value has occurred, it writes down the investment to its fair value and recognizes the credit loss in earnings and the non-credit loss in accumulated other comprehensive income or loss. There were no securities in an unrealized loss position as of March 31, 2019. The aggregate fair value of the marketable securities in an unrealized loss position was $43.0 million as of September 30, 2018. Aggregate unrealized losses for these securities were insignificant as of September 30, 2018 and are presented in the table above. As of September 30, 2018, marketable securities in an unrealized loss position were comprised primarily of U.S. Treasury securities, corporate securities, and municipal securities. The securities in an unrealized loss position as of September 30, 2018 were not considered other-than-temporarily impaired and, as such, the Company did not recognize impairment losses during the period then ended. The unrealized losses were attributable to changes in interest rates that impacted the value of the investments.

Cash equivalents of less than $0.1 million and $50.6 million, respectively, at March 31, 2019 and September 30, 2018 consist of money market funds and are classified within Level 1 of the fair value hierarchy because they are valued using quoted market prices in active markets. Cash equivalents of less than $0.1 million at March 31, 2019 consist primarily of bank certificates of deposits with original maturities of less than 90 days and are classified within Level 2 of the fair value hierarchy because they are not actively traded.

5. Acquisitions

Acquisition Completed in Fiscal Year 2019

Acquisition of GENEWIZ

On November 15, 2018, the Company acquired all the outstanding capital stock of GENEWIZ Group ("GENEWIZ"), a leading global genomics service provider headquartered in South Plainfield, New Jersey. GENEWIZ provides genomics services that enable research scientists to advance their discoveries within the pharmaceutical, academic, biotechnology, agriculture and other markets. It provides gene sequencing and synthesis services for more than 4,000 institutional customers worldwide supported by their global network of laboratories spanning the United States, China, Japan, Germany and the United Kingdom. This transaction added a new and innovative platform which the Company expects to leverage, along with its core capabilities, to add even more value to samples under the Company's care.

The total cash purchase price for the acquisition was $442.7 million, net of cash acquired, which included a working capital settlement of $0.4M. The Company used the proceeds of the incremental loan described in Note 8, "Debt" to pay a portion of the purchase price.

On the acquisition date, the Company paid $32.3 million to escrow accounts related to the satisfaction of the seller's indemnification obligations with respect to their representations and warranties and other indemnities. The Company also retained an amount equal to $1.5 million as collateral for any adjustment shortfall based on the final merger consideration calculation. During the three months ended March 31, 2019, the final merger consideration was

calculated to be $4.0 million less than the merger consideration paid at closing. To satisfy the shortfall, the Company reversed the $1.5 million liability associated with the holdback, received approval from the former shareholders to retain $0.7 million of funds the Company received on their behalf, and collected $1.8 million from the escrow accounts.

The Company recorded the following assets acquired and liabilities assumed related to GENEWIZ at their fair values as of the acquisition date, from a market participant's perspective (in thousands). While the Company uses its best estimates and assumptions as part of the purchase price allocation process to value the assets acquired and liabilities assumed on the acquisition date, its estimates and assumptions are subject to refinement. Fair value estimates are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. The judgments used to determine the estimated fair value assigned to each class of assets acquired and liabilities

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assumed, as well as asset lives, can materially impact the Company's results of operations. The finalization of the assignment of fair values will be completed within one year.

	Fair Value of Assets and Liabilities
Accounts receivable, net	$ 26,952
Inventories	4,370
Prepaid expenses and other current assets	11,210
Property, plant and equipment, net	36,379
Goodwill	236,845
Intangible assets, net	188,524
Other assets	16,673
Current portion of long-term debt	(3,170)
Accounts payable	(6,522)
Deferred revenue	(67)
Accrued compensation and benefits	(5,145)
Other current liabilities	(7,446)
Long-term debt	(2,482)
Long-term tax reserves	(13,400)
Long-term deferred tax liabilities	(37,415)
Other long-term liabilities	(2,602)
Total purchase price, net of cash acquired	$ 442,704

The Company applied variations of the income approach to estimate the fair values of the intangibles assets acquired. The identifiable intangible assets include customer relationships (excess earnings method) of $125.4 million with a useful life of 14 years, completed technology (relief from royalty method) of $44.1 million with useful lives from 10 to 15 years and trademarks (relief from royalty method) of $19.0 million with a useful life of 13 years. The intangible assets acquired are amortized over the total weighted average period of 13.3 years using methods that approximate the pattern in which the economic benefits are expected to be realized.

Goodwill of $236.8 million largely reflects the potential synergies and expansion of the Company's core technologies and offerings in the Life Sciences business. The goodwill from this acquisition is reported within the Brooks Life Sciences segment and is not tax deductible. During the three months ended March 31, 2019, a $0.3 million measurement period adjustment was recorded related to the working capital settlement which increased goodwill.

During the three months ended March 31, 2019, the Company made a measurement period adjustment in the amount of $0.7 million to Prepaid expenses and other current assets and $0.7 million to Accrued expenses and other current liabilities. The adjustments had no impact on goodwill.

The revenues and net loss from GENEWIZ recognized in the Company's consolidated results of operations were $32.8 million and $0.3 million, respectively for the three months ended March 31, 2019. The revenues and net income from GENEWIZ recognized in the Company's consolidated results of operations were $49.3 million and $0.5 million, respectively for the reporting period since acquisition. During the three months ended March 31, 2019, and the period since acquisition, net income included $3.2 million and $4.8 million, respectively, related to amortization expense of

acquired intangible assets. The Company incurred $3.8 million in transaction costs with respect to the GENEWIZ acquisition during fiscal year 2018. During the three and six months ended March 31, 2019, the Company incurred $0.1 million and $6.4 million, respectively, in transaction costs, which were recorded in "Selling, general and administrative" expenses within the accompanying unaudited Consolidated Statements of Operations.

The following unaudited pro forma information reflects our consolidated results of operations as if the acquisition had taken place on October 1, 2017. The unaudited pro forma information is not necessarily indicative of the results of operations that we would have reported had the transaction actually occurred at the beginning of these periods nor is it necessarily indicative of future results. The unaudited pro forma financial information does not reflect the impact of

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future events that may occur after the acquisition, including, but not limited to, anticipated costs savings from synergies or other operational improvements (in thousands).

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019 (actual)	2018 (pro forma)	2019 (pro forma)	2018
Revenue	$ 198,390	$ 186,914	$ 394,411	$ 356,947
Net income (loss)	(2,829)	59,077	(38,154)	50,345

The unaudited pro forma financial information presented in the table above has been adjusted to give effect to adjustments that are (1) directly related to the acquisition; (2) factually supportable; and (3) expect to have a continuing impact. These adjustments include, but are not limited to, the application of our accounting policies, elimination of related party transactions, depreciation and amortization related to fair value adjustments to property, plant and equipment and intangible assets, and interest expense on acquisition related debt.

To present our consolidated results of operations as if the acquisition had taken place on October 1, 2017, the unaudited pro forma earnings for the three months and the six months ended March 31, 2018 have been adjusted to include the following additional expenses related to the acquisition: $3.1 million and $6.5 million, respectively, of property, plant, and equipment, leases, and intangible asset step-up depreciation and amortization expense, and $4.8 million and $9.6 million, respectively, of interest expense related to financing activities. Revenue and net income (loss) for the three months ended March 31, 2019, as shown in the above table represents actual restuls as the Company owned GENEWIZ for the full period. The unaudited pro forma information for the six months ended March 31, 2019 consists of GENEWIZ actual results of operations for the three months ended March 31, 2019 and GENWIZ pro forma results of operations for the three months ended December 31, 2018. The unaudited pro forma earnings for the three months ended December 31, 2018 have been adjusted to include $1.6 million of property, plant, and equipment, leases, and intangible asset step-up depreciation and amortization expense, and $2.0 million of interest expense related to financing activities. The net loss of $38.2 million for the six months ended March 31, 2019 is mainly due to the one-time option, bonus, and transaction costs of $43.9 million incurred by GENEWIZ and one-time transaction costs of $6.3 million incurred by Brooks related to the acquisition and actual net loss of $2.8 million for the three months ended March 31, 2019.

Acquisitions Completed in Fiscal Year 2018

Acquisition of Tec-Sem

On April 6, 2018, the Company acquired approximately 93% of the outstanding capital stock of Tec-Sem Group AG (“Tec-Sem”), a Switzerland-based manufacturer of semiconductor fabrication automation equipment with a focus on reticle management. During the fourth quarter of fiscal year 2018, the Company acquired the remaining 7% noncontrolling interest upon the completion of certain procedural steps. The total cash payment to acquire the business was $15.6 million, net of cash acquired and subject to working capital adjustments. The acquisition of Tec-Sem has expanded the Company’s contamination control solutions business within the Brooks Semiconductor Solutions Group segment.

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The company used a market participant approach to record the assets acquired and liabilities assumed with the Tec-Sem acquisition as follows (in thousands):

	Fair Value of Assets and Liabilities
Accounts receivable (approximates contractual value)	$ 988
Inventories	4,297
Prepaid expenses and other current assets	4,038
Property, plant and equipment	85
Intangible assets	10,694
Goodwill	7,665
Accounts payable	(1,049)
Accrued liabilities	(6,962)
Deferred tax liabilities	(1,391)
Accrued pension liability	(2,800)
Total purchase price, net of cash acquired	$ 15,565

The Company applied variations of the income approach to estimate the fair values of the intangibles assets acquired. The identifiable intangible assets include completed technology (excess earnings method) of $8.4 million with a useful life of 10 years, backlog (excess earnings method) of $1.6 million with a useful life of 1 year, and customer relationships (distributor method) of $0.7 million with a useful life of 9 years. The intangible assets acquired are amortized over the total weighted average period of 8.6 years using methods that approximate the pattern in which the economic benefits are expected to be realized.

Goodwill of $7.7 million largely reflects the potential synergies and expansion of technical capabilities to the Company's existing contamination control solutions business. The goodwill from this acquisition is reported within the Brooks Semiconductor Solutions Group segment and is not tax deductible.

As part of the acquisition, the Company assumed all the assets and liabilities of Tec-Sem’s Swiss defined benefit plan, which covered substantially all its full-time employees. At acquisition date, the plan was fully funded for each employee’s pension contribution plus an expected rate of return equal to the statutory discount rate. Total plan assets and plan liability were $5.1 million and $7.9 million, respectively, at acquisition date. The Company recorded a liability of $2.8 million for the unfunded projected benefit obligation related to each plan participant’s future services.

The Company reports the results of operations for Tec-Sem in the Brooks Semiconductor Solutions Group segment starting from the acquisition date. The revenues and net income from Tec-Sem included in the Company's consolidated results for the three months ended March 31, 2019 were $5.7 million and $0.9 million, respectively. The revenues and net income from Tec-Sem included in the Company's consolidated results for the six months ended March 31, 2019 were $15.1 million and $2.6 million, respectively. During the three months ended March 31, 2019, the net income included $0.9 million related to amortization expense of acquired intangible assets. During the six months ended March 31, 2019, the net income included $0.2 million related to the step-up in value of the acquired inventories and $1.8 million related to amortization expense of acquired intangible assets.

The escrow at closing had a balance of $2.6 million which consisted of $1.8 million related to satisfaction of the sellers' indemnification obligations with respect to their representations and warranties and other indemnities. The remaining $0.8 million of the escrow balance is related to a performance obligation that the Company assumed at the acquisition date for the transfer of non-core wafer stocker technology to an unrelated third party. The Company

collected $0.4 million from the escrow during current quarter related to the delivery of the technology.

The Company did not present a pro forma information summary for its consolidated results of operations for the three and six months ended March 31, 2019 and 2018 as if the acquisition of Tec-Sem occurred on October 1, 2016 because such results were immaterial.

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Acquisition of 4titude Limited

On October 5, 2017, the Company acquired all the outstanding capital stock of 4titude Limited ("4titude"), a U.K.-based manufacturer of scientific consumables for biological sample materials used in a variety of genomic and DNA analytical applications. The acquisition of 4titude will expand the Company's existing offerings of consumables and instruments within the Brooks Life Sciences segment. The aggregate purchase price of $65.1 million, net of cash acquired, consisted primarily of a cash payment of $64.8 million subject to working capital adjustments and the assumption of the seller's liabilities of $0.4 million.

The Company used a market participant approach to record the assets acquired and liabilities assumed in the 4titude acquisition as follows (in thousands):

	Fair Value of Assets and Liabilities
Accounts receivable (approximates contractual value)	$ 1,581
Inventories	2,667
Prepaid expenses and other current assets	140
Property, plant and equipment	1,555
Intangible assets	27,212
Goodwill	38,185
Accounts payable	(286)
Accrued liabilities	(845)
Deferred tax liabilities	(5,090)
Total purchase price, net of cash acquired	$ 65,119

The Company applied variations of the income approach to estimate the fair values of the intangibles assets acquired. The identified intangible assets include customer relationships (excess earnings method) of $21.4 million with a useful life of 10 years, completed technology (relief from royalty method) of $5.2 million with a useful life of 13 years, backlog (excess earnings method) of $0.4 million with a useful life of 1 year and trademarks (excess earnings method) of $0.2 million with a useful life of 1 year. The intangible assets acquired are amortized over the total weighted average period of 10.4 years using methods that approximate the pattern in which the economic benefits are expected to be realized.

At the closing of the acquisition of 4titude, a cash payment of $0.4 million was placed into escrow which was ascribed to the purchase price. The escrow was related to potential working capital adjustments and the sellers' satisfaction of general representations and warranties.

Goodwill represents the excess of the consideration paid over the fair value of the net assets acquired and has been assigned to the Brooks Life Sciences segment. Goodwill is primarily the result of expected synergies from combining the operations of 4titude with the Company's operations and is not deductible for tax purposes.

The operating results of 4titude have been reflected in the results of operations for the Brooks Life Sciences segment from the date of the acquisition. During the three months ended March 31, 2019, revenue and net income from 4titude recognized in the Company's results of operations were $4.7 million and $0.3 million, respectively. During the six months ended March 31, 2019, revenue and net loss from 4titude recognized in the Company's results of operations were $8.5 million and $0.4 million, respectively. During the three months ended March 31, 2018, revenue and net loss

from 4titude recognized in the Company's results of operations were $4.3 million and less than $0.1 million, respectively. During the six months ended March 31, 2018, revenue and net loss from 4titude recognized in the Company's results of operations were $7.8 million and $1.2 million, respectively. During the six months ended March 31, 2018, the net loss included non-recurring charges of $1.2 million related to the step-up in value of the acquired inventories. During the three and six months ended March 31, 2019, the net loss included recurring charges of $0.9 million and $1.9 million, respectively, related to amortization expense of acquired intangible assets. During the

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three and six months ended March 31, 2018, the net loss included recurring charges of $1.0 million and $2.1 million, respectively, related to amortization expense of acquired intangible assets.

During the three and six months ended March 31, 2018, the Company incurred $0.5 million and $1.0 million, respectively, in non-recurring transaction costs with respect to the 4titude acquisition, which were recorded in "Selling, general and administrative" expenses within the accompanying unaudited Consolidated Statements of Operations. There were no transaction costs related to the 4titude acquisition during the three and six months ended March 31, 2019.

The Company did not present a pro forma information summary for its consolidated results of operations for the three and six months ended March 31, 2019 and 2018 as if the acquisition of 4titude occurred on October 1, 2016 because such results were immaterial.

Other

On April 20, 2018, the Company acquired BioSpeciMan Corporation (“BioSpeciMan”), a Canadian provider of storage services for biological sample materials. BioSpeciMan, founded in 2002, provides temperature controlled biological sample storage services to an attractive mix of pharma, biotech and contract lab customers. This acquisition has expanded customer relationships and geographic reach within its growing sample management storage services business in the Brooks Life Sciences segment. The total cash payment made by the Company was $5.2 million, net of cash acquired and subject to working capital adjustments.

The Company allocated the purchase price of $5.2 million based on the fair value of the assets and liabilities acquired as of the acquisition date, which included $0.3 million of accounts receivable, $2.6 million of customer relationships, $2.7 million of goodwill and $0.7 million of assumed liabilities. The Company applied the excess earnings method, a variation of the income approach to determine the fair value of the customer relationship intangible asset. The purchase price allocation was based on a preliminary valuation which is subject to further adjustments within the measurement period when additional information becomes available. The goodwill from this acquisition is reported within the Brooks Life Sciences segment and is not tax deductible.

At the acquisition date, a cash payment of $0.5 million was held back for potential working capital adjustments and the sellers' satisfaction of general representations and warranties. These holdback payments were ascribed to the purchase price.

The operating results of the acquisition have been reflected in the results of operations for the Brooks Life Sciences segment from the date of the acquisition. The Company did not present a pro forma information summary for its consolidated results of operations for the three and six months ended March 31, 2019 and 2018 as if the acquisition of BioSpeciMan occurred on October 1, 2016 because such results were immaterial.

6. Goodwill and Intangible Assets

Goodwill represents the excess of net book value over the estimated fair value of net tangible and identifiable intangible assets of a reporting unit. Goodwill is tested for impairment annually or more often if impairment indicators are present at the reporting unit level. If events occur or circumstances change that would more likely than not reduce fair values of the reporting units below their carrying values, goodwill will be evaluated for impairment between annual tests. No triggering events indicating goodwill impairment occurred during the six months ended March 31, 2019. Please refer to Note 7, "Goodwill and Intangible Assets" to the Company's consolidated financial statements included in the

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2018 Annual Report on Form 10-K for further information on the goodwill impairment testing performed during fiscal year 2018.

The components of the Company's goodwill by operating segment at March 31, 2019 and September 30, 2018 are as follows (in thousands):

	Brooks Semiconductor Solutions Group	Brooks Life Sciences	Other	Total
Gross goodwill, at September 30, 2018	$ 636,907	$ 207,913	$ 26,014	$ 870,834
Accumulated goodwill impairments	(588,944)	—	(26,014)	(614,958)
Goodwill, net of accumulated impairments, at September 30, 2018	47,963	207,913	—	255,876
Acquisitions and adjustments	(184)	236,834	—	236,650
Gross goodwill, at March 31, 2019	636,723	444,747	26,014	1,107,484
Accumulated goodwill impairments	(588,944)	—	(26,014)	(614,958)
Goodwill, net of accumulated impairments, at March 31, 2019	$ 47,779	$ 444,747	$ —	$ 492,526

During the six months ended March 31, 2019, the Company recorded a goodwill increase of $236.8 million primarily related to the acquisition of GENEWIZ. Please refer to Note 5 "Acquisitions" for further information on this transaction.

The components of the Company's identifiable intangible assets as of March 31, 2019 and September 30, 2018 are as follows (in thousands):

	March 31, 2019			September 30, 2018		
	Cost	Accumulated Amortization	Net Book Value	Cost	Accumulated Amortization	Net Book Value
Patents	$ 5,302	$ 4,477	$ 825	$ 5,302	$ 4,325	$ 977
Completed technology	88,724	33,592	55,132	44,829	28,934	15,895
Trademarks and trade names	25,318	4,225	21,093	6,298	2,953	3,345
Customer relationships	267,372	73,629	193,743	142,489	62,750	79,739
	$ 386,716	$ 115,923	$ 270,793	$ 198,918	$ 98,962	$ 99,956

Amortization expense for intangible assets was $17.2 million and $11.1 million, respectively, during the six months ended March 31, 2019 and 2018.

Estimated future amortization expense for the intangible assets for the remainder of fiscal year 2019, the subsequent four fiscal years and thereafter is as follows (in thousands):

Fiscal year ended September 30,	
2019	$ 17,993
2020	41,339
2021	37,546
2022	34,545
2023	31,589
Thereafter	107,781
	$ 270,793

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7. Line of Credit

The Company maintains a revolving line of credit with Wells Fargo Bank, N.A. and JPMorgan Chase Bank, N.A that provides for revolving credit financing of up to $75.0 million, subject to borrowing base availability, as defined in the credit agreement. The line of credit matures on October 4, 2022 and expires no less than 90 days prior to the term loan expiration. The proceeds from the line of credit are available for permitted acquisitions and general corporate purposes.

On October 4, 2017, the Company entered into a $200.0 million Senior Secured Term Loan Facility (the “term loan”) with Morgan Stanley Senior Funding, Inc., JPMorgan Chase Bank, N.A. and Wells Fargo Securities, LLC (collectively, the “lenders”). Coincident with the entry into the term loan agreement, the Company amended certain terms and conditions of the credit agreement and entered into an arrangement with Wells Fargo Bank, N.A. and JPMorgan Chase Bank, N.A. Based on the amended terms of the credit agreement, the line of credit continues to provide for revolving credit financing of up to $75.0 million, subject to borrowing base availability. Borrowing base availability under the amended line of credit excludes collateral related to fixed assets and is redetermined periodically based on certain percentage of certain eligible U.S. assets, including accounts receivable and inventory. The sub-limits for letters of credit were reduced to $7.5 million under the amended terms of the credit agreement. All outstanding borrowings under the credit agreement are guaranteed by the Company and BioStorage Technologies, Inc., its wholly-owned subsidiary, and subordinated to the obligations under the term loan which are secured by a first priority lien on substantially all of the assets of the Company and the guarantor, other than accounts receivable and inventory. Please refer to Note 8, “Debt”, for further information on the term loan transaction.

There were no amounts outstanding under the line of credit as of March 31, 2019 and September 30, 2018. The Company records commitment fees and other costs directly associated with obtaining line of credit financing as deferred financing costs which are presented within "Other assets" in the accompanying unaudited Consolidated Balance Sheets. Deferred financing costs were $0.4 million and $0.5 million, respectively, at March 31, 2019 and September 30, 2018. Such costs are amortized over the term of the related financing arrangement and are included in “Interest expense” in the accompanying unaudited Consolidated Statements of Operations. The line of credit contains certain customary representations and warranties, a financial covenant and affirmative and negative covenants as well as events of default. The Company was in compliance with the line of credit covenants as of March 31, 2019 and September 30, 2018.

8. Debt

Term Loans

On October 4, 2017, the Company entered into a $200.0 million term loan with the lenders. The term loan was issued at $197.6 million, or 98.8% of its par value, resulting in a discount of $2.4 million, or 1.2%, which represented loan origination fees paid at the closing. On November 15, 2018, the Company entered into an incremental Amendment (the “Amendment”) to the existing credit agreement. Under the Amendment, the Company obtained an incremental term loan in an aggregate principal amount of $350.0 million. The proceeds of the incremental loan were used to finance a portion of the purchase price for the Company’s acquisition of GENEWIZ. The term loan was issued at $340.5 million, or 97.3% of its par value, resulting in a discount of $9.5 million, or 2.7%, which represented financing cost of the loan. Except as provided in the Amendment, the incremental loan is subject to the same terms and conditions as set forth in the existing credit agreement. The loan principal amount may be increased by an aggregate amount equal to

$75.0 million plus any voluntary repayments of the term loans plus any additional amount such that the secured leverage ratio of the Company is less than 3.00 to 1.00.

On February 15, 2019, the Company syndicated the incremental term loan to a group of new lenders which met the criteria of a debt extinguishment. The Company wrote off the carrying value of the incremental term loan of $340.1 million as of February 15, 2019 and recorded the syndicated incremental term loan at its present value for $349.1 million and a loss on debt extinguishment for $9.1 million. The syndicated loan was issued at $345.2 million, or 98.9% of its par value resulting in a discount of $4.0 million which represented financing costs which are presented as a reduction of the term loan principal balance in the accompanying unaudited Consolidated Balance Sheets and will be accreted over the

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life of the loan. Except as provided in the Amendment for increase of interest rates, the new loan is subject to the same terms and conditions as set forth in the incremental term loan.

Under the terms of the Amendment, the Company may elect that the borrowings comprising the incremental loan bear interest at a rate per annum equal to (a) the Alternate Base Rate (the "ABR") plus 1.50%; or (b) the Adjusted LIBOR plus 2.50%. ABR is equal to the highest of (a) the federal funds effective rate plus 0.50%, (b) the prime rate, or (c) one-month LIBOR rate plus 1.00%. The LIBOR is equal to the rate for eurodollar deposits in the London interbank market for a period of one, two, three or six months, in each case selected by the Company. "Adjusted LIBOR" is the LIBOR as adjusted for statutory reserve requirements for eurodollar liabilities. On February 15, 2019, in connection with the syndication of the incremental term loan, the Company entered into a second Amendment (the "Second Amendment") to the existing credit agreement. Under the Second Amendment, interest rate increased 0.5%. The Company may elect that the borrowings comprising the incremental loan bear interest at a rate per annum equal to (a) the Alternate Base Rate (the "ABR") plus 2.00%; or (b) the Adjusted LIBOR plus 3.00%.

The Company's obligations under the term loan are also guaranteed by BioStorage Technologies, Inc. as the guarantor, subject to the terms and conditions of the term loan agreement. The Company and the guarantor granted the lenders a perfected first priority security interest in substantially all of the assets of the Company and the guarantor to secure the repayment of the term loan.

The term loan matures and becomes fully payable on October 4, 2024. The principal is payable in installments equal to 0.25% of the initial principal amount of the term loans on March 31st, June 30th, September 30th and December 31st of each year, commencing on March 31, 2018, with any remaining amount of principal becoming due and payable on the maturity date. All accrued and unpaid interest on Borrowings shall be due on the last day of each interest period elected by the Company for such Borrowings, except for interest periods of more than three months in which case all accrued and unpaid interest shall be due and payable every three months.

Subject to certain conditions stated in the term loan agreement, the Company may redeem the term loan at any time at its option without a significant premium or penalty, except for a repricing transaction, as defined in the term loan agreement. The Company would be required to redeem the term loan at the principal amount then outstanding upon occurrence of certain events, including (i) net proceeds received from the sale or other disposition of the Company's or guarantor' assets, subject to certain limitations, (ii) casualty and condemnation proceeds received by the Company or the guarantor, subject to certain exceptions, (iii) net proceeds received by the Company or the guarantor from the issuance of debt or disqualified capital stock after October 4, 2017. Commencing on December 31, 2018, the Company will be required to make principal payments equal to the excess cash flow amount, as defined in the term loan agreement. Such prepayments are equal to 50% of the preceding year excess cash flow amount reduced by voluntary prepayments of the term loan, subject to certain limitations.

The Deferred financing costs are accreted over the term of the loan using the effective interest rate method and are included in "Interest expense" in the accompanying unaudited Consolidated Statements of Operations. At March 31, 2019, deferred financing costs were $6.1 million.

The term loan agreement contains certain customary representations and warranties, covenants and events of default. If any of the events of default occur and are not waived or cured within applicable grace periods, any unpaid amounts under the term loan agreement will bear an annual interest rate at 2.00% above the rate otherwise applicable under the terms and conditions of such agreement. The term loan agreement does not contain financial maintenance covenants. As of March 31, 2019, the Company was in compliance with all covenants and conditions under the term loan agreement.

In connection with the GENEWIZ acquisition, we assumed three five-year term loans for a total of $3.3 million and two one-year short term loans for a total of RMB 22 million or $3.2 million. The three five-year term loans were initiated during 2016 and mature in 2021. The principal payments are payable in eight installments equal to 12.5% of the initial principal amount of the term loans on December 14th and June 14th of each year, commencing in 2017. The three five-year term loans were secured to fund equipment payments and the interest rates were equal to the LIBOR plus 3.1%. The two one-year term loans were borrowed to fund operations. Both of the one-year term loans were initiated in

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2018 and mature in 2019. The principal payments are due at the maturity date. The interest rates of these two loans were 4.56% and 4.35%. There is no deferred financing costs related to either the five-year term loans or the one-year term loans. At March 31, 2019, we had an aggregate outstanding principal balance of $2.1 million and $1.8 million for the three five-year term loans and two one-year short term loans, respectively.

During the six months ended March 31, 2019, the weighted average stated interest rate paid on all outstanding debt was 5.2%. During the six months ended March 31, 2019, the Company incurred aggregate interest expense of $13.3 million in connection with the borrowings, including $0.9 million of deferred financing costs amortization.

As of March 31, 2019, the estimated fair value of the outstanding principal balance of the debt no our balance sheet approximates its carrying value. The fair value was determined based on observable market inputs and classified within Level 2 of the fair value hierarchy due to a lack of an active market for this term loan or a similar loan instrument.

The following are the future minimum principal payment obligations under all of the Company’s outstanding debt as of March 31, 2019 (in thousands):

	Amount
Fiscal year ended September 30,	
2019	$ 4,951
2020	6,327
2021	6,327
2022	5,500
2023	5,500
Thereafter	521,000
Total outstanding principal balance	549,605
Unamortized deferred financing costs	(6,107)
	543,498
Current portion of long-term debt	8,114
Non-current portion of long-term debt	$ 535,384

Capital Lease Obligations

In connection with the GENEWIZ acquisition, the Company assumed five capital lease obligations related to leases of equipment. Three of the capital leases were initiated in 2016 and mature in 2021 and two of them were initiated in 2017 and mature in 2022. The outstanding principal balance of these obligations is included within “Other long-term liabilities” on the Company’s Consolidated Balance Sheets. See below for the future minimum principal payment obligations under the capital lease obligations as of March 31, 2019 (in thousands):

	Amount
Fiscal year ended September 30,	
2019	$ 639

2020	1,176
2021	1,126
2022	358
Total outstanding principal balance	$ 3,299

9. Income Taxes

The Company recorded an income tax benefit of $1.0 million and $6.9 million, respectively, during the three and six months ended March 31, 2019. The tax benefit for three months was driven by U.S. losses during the period and includes $0.4 million of stock compensation windfalls. These benefits were slightly offset by the tax provision on foreign earnings during the period and a discrete expense related to interest accruing on uncertain tax positions. The tax benefit for the six months ended March 31, 2019 was primarily driven by discrete benefits related to stock compensation

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windfalls of $4.1 million for tax deductions that exceeded the associated compensation expense, $1.4 million of tax benefits related to the remeasurement of net U.S. deferred tax assets due to state tax rate changes, and a $1.1 million transition tax reduction. These discrete benefits were slightly increased by the tax benefit recorded on losses during the period.

The Company recorded an income tax benefit of $54.5 million and $55.2 million, respectively, during the three and six months ended March 31, 2018. The tax benefit recorded during each period was primarily driven by a discrete benefit due to the reversal of a valuation allowance against U.S. net deferred tax assets during the three months ended March 31, 2018 in the amount of $58.0 million. The tax benefit for the six months ended March 31, 2018 included $0.7 million of tax benefits related to the re-measurement of net U.S. deferred tax liabilities to account for the reduced 21 percent statutory federal income tax rate. This benefit for the three and six months ended March 31, 2018 was partially offset by the tax provisions related to foreign income.

During 2018, the Internal Revenue Service issued proposed regulations on the federal toll charge and various other aspects of the Tax Cuts and Jobs Act. The Company finalized its analysis of the toll charge and related liabilities, including uncertain tax positions, during the three months ended December 31, 2018 pursuant to U.S. Securities and Exchange Commission (“SEC”) Staff Accounting Bulletin No. 118. As a result of the new guidance issued and additional work to complete the calculation of its federal toll charge, the Company reduced its provisional accrual for federal, state and foreign taxes by net $1.1 million during the three months ended December 31, 2018. In addition, the Company also assessed its uncertain tax positions related to these taxes and accrued income and determined no tax reserves were required.

The Company evaluates the realizability of its deferred tax assets by tax-paying component and assesses the need for a valuation allowance on an annual and quarterly basis. The Company evaluates the profitability of each tax-paying component on a historic cumulative basis and a forward-looking basis while performing this analysis. The Company evaluated all positive and negative evidence in concluding it was appropriate to release the majority of the valuation allowance against U.S. net deferred tax assets during fiscal year 2018. The remaining portion of the Company’s U.S. valuation allowance is related to the realizability of certain state tax credits and net operating loss carry-forwards. The Company continues to maintain valuation allowances against net deferred tax assets in certain foreign tax-paying components as of March 31, 2019.

The Company maintains liabilities for uncertain tax positions. These liabilities involve judgment and estimation and are monitored based on the best information available. The Company recognizes interest related to unrecognized benefits as a component of the income tax benefit. The Company recognized interest expense related to its unrecognized tax benefits of $0.4 million and $0.5 million, respectively, during the three and six months ended March 31, 2019. During the six months ended March 31, 2018 the statute of limitations lapsed on an uncertain tax positions in a foreign jurisdiction which resulted in a $0.3 million reduction in the gross unrecognized tax benefits that impacted the effective tax rate.

The Company is subject to U.S. federal income tax and state, local and international income taxes in various jurisdictions. The amount of income taxes paid is subject to the Company’s interpretation of applicable tax laws in the jurisdictions in which it files tax returns. In the normal course of business, the Company is subject to income tax audits in various global jurisdictions in which it operates. The years subject to examination vary for the U.S. and international jurisdictions, with the earliest tax year being 2011. Based on the outcome of these examinations or the expiration of statutes of limitations for specific jurisdictions, it is reasonably possible that the related unrecognized tax benefits could change from those recorded in the Company’s unaudited Consolidated Balance Sheets. The Company currently anticipates that it is reasonably possible that the unrecognized tax benefits will be reduced by approximately $0.1 million within the next twelve months.

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10. Other Balance Sheet Information

The following is a summary of accounts receivable at March 31, 2019 and September 30, 2018 (in thousands):

	March 31, 2019	September 30, 2018
Accounts receivable	$ 166,247	$ 126,350
Less allowance for doubtful accounts	(2,548)	(1,113)
Less allowance for sales returns	(46)	(45)
Accounts receivable, net	$ 163,653	$ 125,192

The following is a summary of inventories at March 31, 2019 and September 30, 2018 (in thousands):

	March 31, 2019	September 30, 2018
Inventories		
Raw materials and purchased parts	$ 68,534	$ 57,527
Work-in-process	15,607	19,547
Finished goods	24,371	19,912
Total inventories	$ 108,512	$ 96,986

Reserves for excess and obsolete inventory were $16.1 million and $15.0 million, respectively, at March 31, 2019 and September 30, 2018.

At March 31, 2019 and September 30, 2018, the Company had cumulative capitalized direct costs of $7.5 million and $5.6 million, respectively, associated with the development of software for its internal use which are included within "Property, plant and equipment, net" in the accompanying unaudited Consolidated Balance Sheets. During the six months ended March 31, 2019, the Company capitalized direct costs of $1.0 million associated with the development of software for its internal use.

The Company establishes reserves for estimated costs of product warranties based on historical information. Product warranty reserves are recorded at the time product revenue is recognized, and retrofit accruals are recorded at the time retrofit programs are established. The Company’s warranty obligation is affected by product failure rates, utilization levels, material usage, service delivery costs incurred in correcting a product failure and supplier warranties on parts delivered to the Company.

The following is a summary of product warranty and retrofit activity on a gross basis for the three and six months ended March 31, 2019 and 2018 (in thousands):

Activity -Three Months Ended March 31, 2019			
Balance December 31, 2018	Accruals	Costs Incurred	Balance March 31, 2019

$ 6,851	$ 1,807	$ (1,456)	$ 7,202

Activity -Three Months Ended March 31, 2018

Balance December 31, 2017	Accruals	Costs Incurred	Balance March 31, 2018
$ 5,574	$ 1,375	$ (1,315)	$ 5,634

Activity -Six Months Ended March 31, 2019

Balance September 30, 2018	Accruals	Costs Incurred	Balance March 31, 2019
$ 6,340	$ 4,161	$ (3,299)	$ 7,202

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Activity -Six Months Ended March 31, 2018

Balance September 30, 2017	Accruals	Costs Incurred	Balance March 31, 2018
$ 5,479	$ 2,784	$ (2,629)	$ 5,634

11. Stock-Based Compensation

The Company may issue to eligible employees restricted stock units and restricted stock awards (collectively "restricted stock units") and stock options which vest upon the satisfaction of a performance condition and/or a service condition. In addition, the Company issues shares to participating employees pursuant to an employee stock purchase plan and restricted stock units to its directors in accordance with its director compensation program.

The following table reflects stock-based compensation expense recorded during the three and six months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Restricted stock units	$ 4,923	$ 4,882	$ 8,883	$ 9,267
Employee stock purchase plan	198	192	414	370
Total stock-based compensation expense	$ 5,121	$ 5,074	$ 9,297	$ 9,637

The fair value of restricted stock units is determined based on the number of shares granted and the closing price of the Company’s common stock quoted on the Nasdaq Stock Market on the date of grant. The Company recognizes stock-based compensation expense on a straight-line basis, net of estimated forfeitures, over the requisite service period. Additionally, the Company assesses the likelihood of achieving the performance goals against previously established performance targets in accordance with the Company’s long-term equity incentive plan for stock-based awards that vest upon or after the satisfaction of these goals.

The Company grants restricted stock units that vest over a required service period and/or achievement of certain operating performance goals. Restricted stock units granted with performance goals may also have a required service period following the achievement of all or a portion of the performance goals. The following table reflects restricted stock units granted during the six months ended March 31, 2019 and 2018:

	Total Units	Time-Based Units	Stock Grants	Performance-Based Units
Six months ended March 31, 2019	789,409	327,500	38,520	423,389
Six months ended March 31, 2018	507,556	192,291	34,926	280,339

Among the total restricted stock units granted, 28,493 shares were granted to the employees who belong to the discontinued operation during the six months ended March 31, 2018. No shares were granted to the employees who belong to the discontinued operation during the six months ended March 31, 2019.

Time-Based Grants

Restricted stock units granted with a required service period typically have three-year vesting schedules in which one-third of awards vest at the first anniversary of the grant date, one-third vest at the second anniversary of the grant date and one-third vest at the third anniversary of the grant date, subject to the award holders meeting service requirements.

Stock Grants

The stock awards granted to the members of the Company’s Board of Directors include restricted stock awards and deferred restricted stock units.

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Certain members of the Board of Directors have elected to defer receiving their annual awards of restricted stock units and related quarterly dividends until they attain a certain age or cease to provide services as the Company's Board members. Restricted stock awards granted in fiscal years 2017 and 2018 are subject to a one-year vesting period, while the restricted stock awards granted in fiscal year 2019 vested upon the grant date.

Performance-Based Grants

Performance-based restricted stock units are earned based on the achievement of performance criteria established by the Human Resources and Compensation Committee and approved by the Board of Directors. The criteria for performance-based awards have threshold, target and maximum performance goals.

Performance-based awards granted in fiscal year 2019, 2018 and 2017 allow participants to earn 100% of restricted stock units if the Company's performance meets its target goal for each applicable financial metric, and up to a maximum of 200% if the Company's performance for such metrics meets or exceeds the maximum or stretch goal. Performance below the threshold financial metric results in award forfeiture. Performance goals for each plan will be measured over a three-year period for each plan and at the end of the period. Around the third anniversary of each plan's grant date, the Company's Board of Directors determines the number of units earned for participants who continue to meet the service requirements on the vest date.

Restricted Stock Unit Activity

The following table summarizes restricted stock unit activity for the six months ended March 31, 2019:

	Shares	Weighted Average Grant-Date Fair Value
Outstanding at September 30, 2018	2,194,512	$ 17.20
Granted	789,409	30.45
Vested	(961,436)	18.37
Forfeited	(37,083)	22.55
Outstanding at March 31, 2019	1,985,402	24.14

The weighted average grant date fair value of restricted stock units granted during the three months ended March 31, 2019 and 2018 was $29.73 and $25.41, respectively. The weighted average grant date fair value of restricted stock units granted during the six months ended March 31, 2019 and 2018 was $30.45 and $33.61, respectively. The fair value of restricted stock units vested during the three months ended March 31, 2019 and 2018 was $3.4 million and $0.1 million, respectively. The fair value of restricted stock units vested during the six months ended March 31, 2019 and 2018 was $31.1 million and $19.1 million, respectively. During the six months ended March 31, 2019 and 2018, the Company remitted $14.2 million and $6.3 million, respectively, collected from employees to satisfy their tax obligations as a result of share issuances. Such proceeds collected and remitted were insignificant during the three months ended March 31, 2019 and 2018.

As of March 31, 2019, the unrecognized compensation cost related to restricted stock units that are expected to vest is $32.4 million and will be recognized over an estimated weighted average service period of approximately 1.8 years.

Employee Stock Purchase Plan

The Company maintains an employee stock purchase plan that allows its employees to purchase shares of common stock at a price equal to 85% of the fair market value of the Company's stock at the beginning or the end of the semi-annual period, whichever is lower. There were 59,549 and 66,785 shares, respectively, purchased by employees under the employee stock purchase plan during the six months ended March 31, 2019 and 2018.

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12. Earnings per Share

The calculations of basic and diluted net income per share and basic and diluted weighted average shares outstanding are as follows for the three and six months ended March 31, 2019 and 2018 (in thousands, except per share data):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Income (loss) from continuing operations	$ (2,829)	$ 62,497	$ 3,437	$ 64,116
Income from discontinued operations, net of tax	6,250	4,523	14,399	19,390
Net income	$ 3,421	$ 67,020	$ 17,836	$ 83,506
Weighted average common shares outstanding used in computing basic earnings per share	72,077	70,220	71,760	70,340
Dilutive restricted stock units	215	393	455	568
Weighted average common shares outstanding used in computing diluted earnings per share	72,292	70,613	72,215	70,908
Basic net income per share attributable to Brooks Automation, Inc. common stockholders:				
Income (loss) from continuing operations	$ (0.04)	$ 0.89	$ 0.05	$ 0.91
Income from discontinued operations, net of tax	0.09	0.06	0.20	0.28
Basic net income per share attributable to Brooks Automation, Inc.	$ 0.05	$ 0.95	$ 0.25	$ 1.19
Diluted net income per share attributable to Brooks Automation, Inc. common stockholders:				
Income (loss) from continuing operations	$ (0.04)	$ 0.89	$ 0.05	$ 0.90
Income from discontinued operations, net of tax	0.09	0.06	0.20	0.27
Diluted net income per share attributable to Brooks Automation, Inc. common stockholders	$ 0.05	$ 0.95	$ 0.25	$ 1.18
Dividend declared per share	$ 0.10	$ 0.10	$ 0.20	$ 0.20

During the three and the six months ended March 31, 2019, antidilutive restricted stock units of 4,599 and 8,751, respectively, were excluded from the computation of diluted earnings per share based on the treasury stock method. During the three and the six months ended March 31, 2018, antidilutive restricted stock units of 190,517 and 190,266, respectively, were excluded from the computation of diluted earnings per share based on the treasury stock method.

13. Revenue from Contracts with Customers

Revenue Recognition (Performance Obligations)

The Company generates revenue from the following sources:

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Products, including sales of tool automation and automated cold sample management systems, atmospheric and vacuum robots, contamination control solutions, as well as consumables and spare parts.

- Services, including repairs, upgrades, diagnostic support, installation, as well as biological sample services such as DNA sequencing, gene synthesis, molecular biology, bioinformatics, biological sample storage and other support services.

The company recognizes revenue for the transfer of such promised products or services to customers in an amount that reflects the consideration to which the Company expects to be entitled to in exchange for those products or services. Under ASC 606, revenue is recognized when or as the transfer of control of the underlying performance obligation

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occurs. To determine the amount of consideration the Company expects to be entitled to and whether transfer of control has occurred, the Company applies the following five-step model:

- Identify the contract with a customer. Contracts are accounted for when approval and commitment has been received from both parties, the rights of each party are identified, payment terms are identified, the contract has commercial substance and collectability of the consideration to which the Company is entitled is probable. Contracts are generally evidenced through receipt of an approved purchase order or execution of a binding arrangement. Within the Brooks Semiconductor Solutions Group segment, contracts are typically short-term with the exception of service-type warranty contracts, which generally have a stated contract term that is greater than one year. Within the Brooks Life Sciences segment, contracts are both short and long-term. Long-term contracts within this segment relate to the sale of products with attached service-type warranty contracts that generally have a stated contract term that is greater than one year. Contracts within both operating segments may contain acceptance provisions where the Company is required to obtain technical acceptance from the customer upon completion of installation services and evidence of the systems functional performance within the customer's operating environment. The Company has concluded that acceptance criteria within its contracts can be objectively evaluated and will not impact the Company's transfer of control assessment under ASC 606.

- Identify the performance obligations in the contract. Performance obligations include the sale of products and services. Certain customer arrangements related to the sale of automated cold sample management systems and contamination control solution products generally include more than one performance obligation and may include a combination of goods and or services, such as products with installation services or service-type warranty obligations. These contracts include multiple promises and as a result, the Company is required to evaluate each promise and determine whether the promise qualifies as a performance obligation within the contract. Contracts may contain the option to acquire additional products or services at defined prices. The Company reviews the pricing of these options to determine whether the option would exist independently of the current contract. If the pricing of contract options provides a material right to the customer that it would not receive without entering into the current contract, the Company accounts for the option as a separate performance obligation.

- Determine the transaction price. The transaction price of the Company's contracts with its customer is generally fixed, based on the amounts to be contractually billed to the customer. Certain contracts may contain variable consideration in the form of customer allowances and rebates that consist primarily of retrospective volume based discounts and other incentive programs. Variable consideration is estimated at contract inception and included in the transaction price if it is probable that a subsequent change in the estimate would not result in a significant revenue reversal. The period between transfer of control of the performance obligations within a customer contract and timing of payment is generally within one year. As a result, the Company's contracts typically do not include significant financing components.

- Allocate the transaction price to the performance obligations in the contract. For customer contracts that contain more than one performance obligation, the Company allocates the total transaction consideration to each performance obligation based on the relative stand-alone selling price of each performance obligation within the contract. The Company relies on either observable standalone sales or an expected cost plus margin approach to determine the standalone selling price of offerings, depending on the nature of the performance obligation. Performance obligations whose standalone selling price is estimated using an expected cost plus margin approach relate to the sale of customized automated cold sample management systems and service-type warranties within the

Brooks Life Sciences segment.

· Recognize revenue when or as the Company satisfies a performance obligation. The Company satisfies its performance obligations by transferring a product or service either at a point in time or over time, when the transfer of control of the underlying performance obligation has occurred. Control is evidenced by the

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customer's ability to direct the use of, and obtain substantially all the remaining benefits from the performance obligation. Revenue from third-party sales for which the Company does not meet the criteria for gross revenue recognition is recognized on a net basis. All other revenue is recognized on a gross basis. The Company excludes from the transaction price all sales taxes assessed by governmental authorities and as a result, revenue is presented net of tax.

As a result of applying this five-step model under ASC 606, the Company recognizes revenues from its sale of products and services as follows:

- Products: Revenue from the sale of standard products is recognized upon their transfer of control to the customer, which is generally upon delivery. Delivery is considered complete at either the time of shipment or arrival at destination, based on the agreed upon terms within the contract. The Company's payment terms for the sale of standard products are typically 30 to 60 days.

Revenue from the sales of certain products that involve significant customization, which include primarily automated cold sample management systems is recognized over time as the asset created by the Company's performance does not have alternative use to the Company and an enforceable right to payment for performance completed to date is present. The Company recognizes revenue as work progresses based on a percentage of actual labor hours incurred on the project to-date and total estimated labor hours expected to be incurred on the project. The selection of the method to measure progress towards completion requires judgment. The Company has concluded that using the percentage of labor hours incurred to estimated labor hours needed to complete the project most appropriately depicts the Company's efforts towards satisfaction of the performance obligation. The Company develops profit estimates for long-term contracts based on total revenue expected to be generated from the project and total costs anticipated to be incurred in the project. These estimates are based on a number of factors, including the degree of required product customization and the work required to be able to install the product in the customer's existing environment, as well as the Company's historical experience, project plans and an assessment of the risks and uncertainties inherent in the contract related to implementation delays or performance issues that may or may not be within the Company's control. The Company estimates a loss on a contract by comparing total estimated contract revenue to the total estimated contract costs and recognizes a loss during the period in which it becomes probable and can be reasonably estimated. The Company reviews profit estimates for long-term contracts during each reporting period and revises the estimate based on changes in circumstances. Revenue for certain arrangements that involve significant product customization but do not provide the customer with an enforceable right to payment for performance completed to date are recognized at a point in time, upon completion or substantial completion of the project, provided transfer of control has occurred. The project is considered substantially complete when the Company receives acceptance from the customer and remaining tasks are perfunctory or inconsequential and in control of the Company. Generally, the terms of long-term contracts provide for progress billings based on completion of milestones or other defined phases of work. In certain instances, payments collected from customers in advance of recognizing the related revenue are recorded and presented as contract liabilities within Deferred revenue on the Company's Consolidated Balance Sheet. Additionally, due to certain billing constraints within contracts, the customer may retain a portion of the contract price until completion of the contract. In these contracts, revenue recognized may exceed billings, which the Company presents as a contract asset on the balance sheet, which is included within the Prepaid expenses and other current assets on the Company's Consolidated Balance Sheet.

- Services: Service revenue is generally recognized ratably over time or on an output method, as the customer simultaneously receives and consumes the benefit of these services as they are performed. Revenue from short-term services, generally related to repair services or upgrades of customer-owned equipment is recognized upon completion of the repair effort and the shipment of the repaired product back to the customer. Payments related to

service-type warranties may be made up front or proportionally over the contract term. Payment due or received from the customers prior to rendering the associated services are recorded as a contract liability.

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Disaggregated Revenue

The Company disaggregates revenue from contracts with customers in a manner that depicts how the nature, amount, timing, and uncertainty of revenue and cash flows are affected by economic factors. The Company disaggregates revenue based on the transfer of control of the underlying performance obligations, the geographic location in which customer orders are placed and by reporting unit.

The Company transfers control of its performance obligations at a point in time or over time, depending on the nature of the product or service being provided. Revenue from contracts with customers is attributed to geographic areas based on locations in which the customer orders are placed. As discussed within Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in the 2018 Annual Report on Form 10-K, the Company reports financial results for two operating and reportable segments which consist of Brooks Semiconductor Solutions Group segment and Brooks Life Sciences segment. The Company also consists of five reporting units, including three reporting units within the Brooks Semiconductor Solutions Group reporting segment and two reporting units within the Brooks Life Sciences reporting segment. The following is a reconciliation of revenue disaggregated in a manner discussed above to segment revenue for the three and six months ended March 31, 2019 (in thousands):

	Brooks Semiconductor Solutions Group	Brooks Life Sciences	Total
Timing of Revenue Recognition			
Three Months Ended March 31, 2019			
Point in time	$ 111,710	$ 24,983	$ 136,693
Over time	1,167	60,530	61,697
	$ 112,877	$ 85,513	$ 198,390
Six Months Ended March 31, 2019			
Point in time	$ 223,626	$ 48,150	$ 271,776
Over time	1,958	104,023	105,981
	$ 225,584	$ 152,173	$ 377,757

The following is revenue by geographic location and reporting unit for the three and six months ended March 31, 2019 (in thousands):

	Three Months Ended March 31, 2019	Six Months Ended March 31, 2019
Geographic Location		

North America	$ 83,156	$ 152,053
Asia/Pacific/Other	77,653	157,112
United Kingdom	12,540	24,618
Rest of Europe	25,041	43,974
	$ 198,390	$ 377,757
Reporting Unit		
Automation Solutions	$ 72,445	$ 146,120
Contamination Control Solutions	30,047	58,003
Global Semiconductor Services	10,385	21,461
Brooks Semiconductor Solutions Group	112,877	225,584
Sample Management	52,590	102,892
GENEWIZ	32,923	49,281
Brooks Life Sciences	85,513	152,173
Total	$ 198,390	$ 377,757

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Contract Balances

Accounts Receivable, Net. Accounts receivable represent rights to consideration in exchange for products or services that have been transferred by the Company, when payment is unconditional and only the passage of time is required before payment is due. Accounts receivable do not bear interest and are recorded at the invoiced amount. The Company maintains an allowance for doubtful accounts representing its best estimate of probable credit losses related to its existing accounts receivable and their net realizable value. The Company determines the allowance for doubtful accounts based on a number of factors, including an evaluation of customer credit worthiness, the age of the outstanding receivables, economic trends and historical experience. Accounts receivable, net were $163.7 million and $125.2 million at March 31, 2019 and October 1, 2018, respectively.

Contract Assets. Contract assets represent rights to consideration in exchange for products or services that have been transferred by the Company, when payment is conditional on something other than the passage of time. These amounts typically relate to contracts within the Brooks Life Sciences segment where the right to payment is not present until completion of the contract or the achievement of specified milestones and the value of the products or services transferred exceed this constraint. Contract assets are classified as current. Contract asset balances which are included within Prepaid expenses and other current assets on the Company’s Consolidated Balance Sheet, were $4.1 million and $8.2 million at March 31, 2019 and October 1, 2018, respectively.

Deferred Commissions. Deferred commissions represent a direct and incremental cost of obtaining a contract. These amounts primarily relate to sales commissions within the Brooks Life Sciences segment and are deferred and amortized over a 60 month period, which represents the average period of contract performance. The Company classifies deferred commissions as noncurrent as the original amortization period of this asset is greater than one year. Deferred commissions balances are included within Other assets on the Company’s Consolidated Balance Sheet. Deferred commissions were $1.1 million and $1.5 million at March 31, 2019 and October 1, 2018, respectively. The Company recorded $0.2 million and $0.4 million, respectively of amortization expense related to deferred commissions for the three and six months ended March 31, 2019.

Contract Liabilities. Contract liabilities represent the Company’s obligation to transfer products or services to a customer for which consideration has been received, or for which an amount of consideration is due from the customer. Contract assets and liabilities are reported on a net basis at the contract level, depending on the contracts position at the end of each reporting period. Contract liabilities are included within Deferred revenue on the Company’s Consolidated Balance Sheet. Contract liabilities were $31.2 million and $28.7 million at March 31, 2019 and October 1, 2018, respectively. Revenue recognized from the contract liability balance at October 1, 2018 was $11.8 million and $23.9 million, respectively, for the three and six months ended March 31, 2019.

Remaining Performance Obligations. Remaining performance obligations represent the transaction price of unsatisfied or partially satisfied performance obligations within contracts with an original expected contract term that is greater than one year and for which fulfillment of the contract has started as of the end of the reporting period. The aggregate amount of transaction consideration allocated to remaining performance obligations as of March 31, 2019 was $30.4 million. The following table summarizes when the Company expects to recognize the remaining performance obligations as revenue, the Company will recognize revenue associated with these performance obligations as transfer of control occurs (in thousands):

	As of March 31, 2019		
	Less than 1 Year	Greater than 1 Year	Total
Remaining Performance Obligations	$ 16,123	$ 14,235	$ 30,358

Cost to Obtain and Fulfill a Contract

The Company capitalizes sales commissions when incurred if they are (i) incremental costs of obtaining a contract, (ii) expected to be recovered and (iii) have an expected amortization period that is greater than one year. As part of the Company's cumulative effect adjustment, incremental costs associated with obtaining a contract were capitalized and have been classified as deferred commissions within the Company's Consolidated Balance Sheet. These amounts

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primarily relate to sales commissions within the Brooks Life Sciences segment and are being amortized over a 60 month period, which represents the average period of contract performance. The Company did not capitalize any sales commissions during the three or six months ended March 31, 2019 as the amount of sales commissions that qualified for capitalization during the reporting period was insignificant. Sales commissions incurred during the reporting period have been expensed as incurred. These costs are recorded within selling, general, and administration expenses. The Company has concluded that none of its costs incurred in fulfillment of customer contracts meet the capitalization criteria. The Company will account for shipping and handling activities as fulfillment activities and recognize the associated expense when transfer of control of the product has transferred to the customer.

14. Segment Information

The Company operates in two reportable segments: Brooks Semiconductor Solutions Group and Brooks Life Sciences. Brooks Life Sciences consists of two operating segments aggregated into one reportable segment.

The Brooks Semiconductor Solutions Group segment provides a variety of products, services and solutions that enable improved throughput and yield in controlled operating environments, as well as an extensive range of support services. The solutions include atmospheric and vacuum robots, robotic modules, tool automation systems, contamination control of wafer carrier front opening unified pods and reticle management. The support services include repair services, diagnostic support services, and installation services in support of the products, which enable the customers to maximize process tool uptime and productivity. This segment also provides end-user customers with spare parts and productivity enhancement upgrades to maximize tool productivity.

The Brooks Life Sciences segment provides comprehensive life cycle sample management solutions to life science and bioscience customers including complete end-to-end “cold chain of custody” solutions and a variety of sample-based lab services such as genomic sequencing and synthesis to advance scientific research and support drug development. The segment’s product offerings include automated cold sample management systems for compound and biological sample storage, equipment for sample preparation and handling, consumables, and informatics that help customers manage samples throughout their research discovery and development work flows. The segment’s service offerings include sample storage, genomic sequencing, genomic synthesis, lab processing services, lab analysis, and other support services provided to a wide range of life science customers, including pharmaceutical companies, biotechnology companies, biobanks and research institutes.

Revenue and adjusted operating income (loss) are two key metrics used by the CODM when assessing operating results and management performance as resources are allocated to each of the operating segments. The adjusted operating income (loss) for each segment includes selling, general and administrative expenses directly attributable to the segment, and corporate allocations for general and administrative support. Amortization of acquired intangible assets (excluding completed technology), restructuring and other charges, pension settlement, in-process research and development, and other unallocated corporate expenses are excluded from the segments’ adjusted operating income (loss). Please refer to Note 20, "Segment and Geographic Information" to the Company’s consolidated financial statements included in the 2018 Annual Report on Form 10 K for further information on the operating segments’ description and accounting policies.

In conjunction with the acquisition of GENEWIZ during the quarter ended December 31, 2018, the Company reassessed Brooks segment reporting structure and determined that GENEWIZ represents a separate operating segment based on ASC 280. As permitted by ASC 280 Segment Reporting, the Company assessed and elected to

aggregate the Sample Management operating segment with the GENEWIZ operating segment as a single reportable segment titled Brooks Life Sciences. We have aggregated the two operating segments as one reporting segment based on similarities in long-term forecasted economic characteristics, particularly adjusted operating income, similarity in services they offer, the customers they serve, the nature of their service delivery models, and their regulatory environments. The Company believes that the aggregated presentation is more useful to investors and other financial users. Management formally assesses the long-term financial outlook of its operating segments on an annual basis as part of its strategic planning process and more frequently on an informal basis. The customer bases of the operating segments overlap, serving life science and bioscience customers in the pharmaceutical, bio-technology, academic and government institutions. Both operating segments, provide services relating to the biological samples needed to advance non-clinical and clinical

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research, serving scientific and business operations functions. In a typical customer workflow, a biological sample is collected, processed and analyzed with results interpreted and used to make scientific judgements. Critical or valuable samples are then annotated and stored for many years in environments where they can be easily retrieved for additional study. The operating segments provide services across this workflow. Both operating segments services meeting standards of Good Manufacturing Practices (GMP) set forth by the U.S. Food and Drug Administration (FDA).

The following is the summary of the financial information for the Company's operating and reportable segments for the three and six months ended March 31, 2019 and 2018(in thousands):

	Brooks Semiconductor Solutions Group	Brooks Life Sciences	Total
Three Months Ended March 31, 2019:			
Revenue			
Products	$ 102,195	$ 25,861	$ 128,056
Services	10,682	59,652	70,334
Segment revenue	$ 112,877	$ 85,513	$ 198,390
Gross profit	$ 45,987	$ 34,529	$ 80,516
Segment operating income	17,987	3,143	21,130
Depreciation expense	1,017	3,762	4,779
Three Months Ended March 31, 2018:			
Revenue			
Products	$ 97,565	$ 23,466	$ 121,031
Services	10,848	25,073	35,921
Segment revenue	$ 108,413	$ 48,539	$ 156,952
Gross profit	$ 43,457	$ 18,929	$ 62,386
Segment operating income (loss)	15,424	1,496	16,920
Depreciation expense	996	2,039	3,035
Six Months Ended March 31, 2019:			
Revenue			
Products	$ 203,996	$ 49,434	$ 253,430
Services	21,588	102,739	124,327
Segment revenue	$ 225,584	$ 152,173	$ 377,757
Gross profit	$ 91,901	$ 60,695	$ 152,596
Segment operating income	34,128	4,733	38,861
Depreciation expense	1,934	6,532	8,466
Six Months Ended March 31, 2018:			
Revenue			
Products	$ 181,356	$ 45,447	$ 226,803
Services	22,214	50,534	72,748
Segment revenue	$ 203,570	$ 95,981	$ 299,551
Gross profit	$ 81,952	$ 34,693	$ 116,645

Segment operating income	27,143	101	27,244
Depreciation expense	2,022	3,588	5,610
Assets:			
March 31, 2019	$ 281,909	$ 909,820	$ 1,191,729
September 30, 2018	264,452	410,581	675,033

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The following is a reconciliation of the Company's operating and reportable segments' operating income and segment assets to the corresponding amounts presented in the accompanying unaudited Consolidated Statements of Operations for the three and six months ended March 31, 2019 and 2018 and Consolidated Balance Sheets as of March 31, 2019 and September 30, 2018 (in thousands):

	Three Months Ended March 31,		Six Months Ended March 31,	
	2019	2018	2019	2018
Segment operating income	$ 21,130	$ 16,920	$ 38,861	$ 27,244
Amortization of acquired intangible assets	6,614	4,629	12,382	9,217
Restructuring charges	370	47	429	48
Other unallocated corporate expenses	474	1,923	7,046	2,733
Total operating income	$ 13,672	$ 10,321	$ 19,004	$ 15,246

	March 31, 2019	September 30, 2018
Segment assets	$ 1,191,729	$ 675,033
Cash, cash equivalents and marketable securities	140,059	251,226
Deferred tax assets	28,012	43,798
Assets held for sale	128,077	125,200
Total assets	$ 1,487,877	$ 1,095,257

15. Significant Customers

The Company had no customer that accounted for 10% or more of its consolidated revenue, during each of the three and six months ended March 31, 2019 and 2018. As of March 31, 2019 and September 30, 2018, the Company had no customers that accounted for 10% or more of the Company's total receivables.

For purposes of determining the percentage of revenue generated from any of the Company's original equipment manufacturer (the "OEM") customers, the Company does not include revenue from products sold to contract manufacturer customers who in turn sell to the OEMs. If the Company included revenue from products sold to contract manufacturer customers supporting the Company's OEM customers, the percentage of the Company's total revenue derived from certain OEM customers would be higher.

16. Commitments and Contingencies

Letters of Credit

As of March 31, 2019, the Company had approximately $1.3 million of letters of credit outstanding related primarily to customer advances and other performance obligations. These arrangements guarantee the refund of advance payments received from our customers in the event that the product is not delivered, or warranty obligations are not

fulfilled in accordance with the contract terms. These obligations could be called by the beneficiaries at any time before the expiration date of the particular letter of credit if the Company fails to meet certain contractual requirements. None of these obligations were called during the three months ended March 31, 2019, and the Company currently does not anticipate any of these obligations to be called in the near future.

Purchase Commitments

The Company had non-cancellable contracts and purchase orders for inventory of $88.3 million as of March 31, 2019.

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Contingencies

The Company is subject to various legal proceedings, both asserted and unasserted, that arise in the ordinary course of business. The Company cannot predict the ultimate outcome of such legal proceedings or in certain instances provide reasonable ranges of potential losses. However, as of the date of this report, the Company believes that none of these claims will have a material adverse effect on its consolidated financial position or results of operations. In the event of unexpected subsequent developments and given the inherent unpredictability of these legal proceedings, there can be no assurance that the Company's assessment of any claim will reflect the ultimate outcome, and an adverse outcome in certain matters could, from time to time, have a material adverse effect on the Company's consolidated financial position or results of operations in particular quarterly or annual periods.

17. Subsequent Events

Dividend

On April 26, 2019, the Company's Board of Directors declared a cash dividend of $0.10 per share payable on June 28, 2019 to common stockholders of record as of June 7, 2019. Dividends are declared at the discretion of the Company's Board of Directors and depend on the Company's actual cash flows from operations, its financial condition and capital requirements and any other factors the Company's Board of Directors may consider relevant. Future dividend declarations, as well as the record and payment dates for such dividends, will be determined by the Company's Board of Directors on a quarterly basis.

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

The Management's Discussion and Analysis of Financial Condition and Results of Operations, or MD&A, describes principal factors affecting the results of our operations, financial condition and liquidity as well as our critical accounting policies and estimates that require significant judgment and thus have the most significant potential impact on our unaudited consolidated financial statements included elsewhere in this Quarterly Report on Form 10-Q. Our MD&A is organized as follows:

- Overview. This section provides a general description of our business and operating segments as well as a brief discussion and overall analysis of our business and financial performance, including key developments affecting the Company during the three and six months ended March 31, 2019 and 2018.
- Critical Accounting Policies and Estimates. This section discusses accounting policies and estimates that require us to exercise subjective or complex judgments in their application. We believe these accounting policies and estimates are important to understanding the assumptions and judgments incorporated in our reported financial results.
- Results of Operations. This section provides an analysis of our financial results for the three and six months ended March 31, 2019 compared to the three and six months ended March 31, 2018.
- Liquidity and Capital Resources. This section provides an analysis of our liquidity and changes in cash flows as well as a discussion of available borrowings and contractual commitments.

You should read the MD&A in conjunction with our unaudited consolidated financial statements and related notes included elsewhere in this Quarterly Report on Form 10-Q. In addition to historical information, the MD&A contains forward-looking statements that involve risks and uncertainties. You should read "Information Related to Forward-Looking Statements" below for a discussion of important factors that could cause our actual results to differ materially from our expectations.

In the fourth quarter of fiscal year 2018, we entered into a definitive agreement to sell our semiconductor cryogenics business to Edwards Vacuum LLC (a member of the Atlas Copco Group) for approximately $675.0 million in cash subject to customary adjustments. We originally acquired the cryogenics business in 2005 as part of the acquisition of Helix Technology Corporation. The closing of our sale of the cryogenics business is subject to various closing conditions and regulatory approvals. As part of this sale, we will transfer our intellectual property, or IP, for our cryogenics pump products, but not our IP related to our semiconductor automation or life sciences businesses. The semiconductor cryogenics business has been classified as discontinued operations and, unless otherwise noted, the description of our business and the results of operations in this MD&A relates solely to our continuing operations and does not include the operations of our semiconductor cryogenics business.

Information Related to Forward-Looking Statements

This Quarterly Report on Form 10 Q contains statements that are, or may be considered to be, forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995, as amended, Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements that are not historical facts, including statements about our beliefs or expectations, are forward-looking statements. These statements may be identified by such forward-looking terminology as "expect," "estimate," "intend," "believe," "anticipate," "may," "will," "should," "could," "continue," "likely" or similar statements or variations of such terms Forward-looking statements include, but are not limited to, statements that relate to our future revenue, margins, costs, earnings, profitability, product development, demand, acceptance and market share, competitiveness, market opportunities and performance, levels of research and development, the success of our marketing, sales and service efforts, outsourced activities, operating expenses, anticipated manufacturing, customer and technical requirements, the ongoing viability of the solutions that we offer and our customers' success, tax expenses, our management's plans and objectives for our current and future operations and business focus, the expected benefits and other statements relating to

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our divestures and acquisitions, our adoption of the newly issued accounting guidance, the levels of customer spending, general economic conditions, the sufficiency of financial resources to support future operations, capital expenditures and future acquisitions, divestitures and other strategic transactions. Such statements are based on current expectations and involve risks, uncertainties and other factors which may cause the actual results, our performance or our achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Such factors include the Risk Factors which are set forth in our Annual Report on Form 10 K for the fiscal year ended September 30, 2018, or the 2018 Annual Report on Form 10-K and which are incorporated herein by reference. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof and are based on information currently and reasonably known to us. We do not undertake any obligation to release revisions to these forward-looking statements, which may be made to reflect events or circumstances that occur after the date of this Quarterly Report on Form 10 Q or to reflect the occurrence or effect of anticipated or unanticipated events. Precautionary statements made herein should be read as being applicable to all related forward-looking statements wherever they appear in this Quarterly Report on Form 10 Q. Any additional precautionary statements made in our 2018 Annual Report on Form 10 K should be read as being applicable to all related forward-looking statements whenever they appear in this Quarterly Report on Form 10 Q.

Unless the context indicates otherwise, references in this Quarterly Report on Form 10 Q to "we", "us", "our" and "the Company" refer to Brooks Automation, Inc. and its subsidiaries.

OVERVIEW

We are a leading global provider of automation and cryogenic solutions for multiple markets. We primarily serve two distinct and unrelated markets: the semiconductor capital equipment market and the life sciences sample management market. We believe our leadership positions and our global support capability in each of these markets makes us a valued business partner to the largest semiconductor capital equipment and device makers, and pharmaceutical and life science research institutions in the world. Our offerings are also applied to other adjacent technology and industrial markets, and we provide customer support services globally.

In the semiconductor capital equipment market, equipment productivity and availability are critical factors for our customers, who typically operate equipment under demanding temperature and/or pressure environments. We are a leader in wafer automation and contamination controls solutions and services that are designed to improve throughput, yield, and cost of ownership of tools in semiconductor fabs. Our product offerings include vacuum and atmospheric robots, turnkey vacuum and atmospheric wafer handling systems, as well as wafer carrier cleaning and reticle storage systems. We also capture the complete life cycle of value through our global service network of expert application and field engineers who are located close to our customers. Our services include rapid refurbishment of robots to stringent specifications, upgrades to improve equipment productivity, and proactive monitoring and diagnostics for predictive risk management and improved up-time of the installed base. Although the demand for semiconductors and semiconductor manufacturing equipment is cyclical resulting in periodic expansions and contractions, we expect the semiconductor equipment market to remain one of our principal markets as we continue making investments to maintain and grow our semiconductor product and service offerings. A majority of our research and development spending advances our current product lines and drives innovations for new product offerings. We invest in research and development initiatives within the Brooks Semiconductor Solutions Group segment to maintain continued leadership position in the markets we serve. Our Vacuum Automation platform, MagnaTran LEAP™, is for the rapidly emerging advanced technologies related to manufacturing 10 nanometer design rule semiconductor chips. MagnaTran LEAP™ is well positioned to deliver clean, accurate and fast wafer transport available for the fast-growing Deposition and Etch markets. In addition, we expect to continue to support and expand our technology and product offerings for the semiconductor market through acquisitions. In fiscal year 2018, we acquired Tec-Sem Group AG, or Tec-Sem, a Switzerland-based provider of semiconductor fabrication automation equipment with a focus on reticle management.

The acquisition has enhanced our contamination controls solutions offerings.

In the life sciences sample-based services market, we utilize our core competencies and capabilities in automation and cryogenics to provide comprehensive bio-sample management solutions to a broad range of end markets within the life sciences industry. Our offerings include automated ultra-cold storage freezers, consumable sample storage containers, instruments which assist in the workflow of sample management, on-site and off-site full sample

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management services, gene sequencing services and gene synthesis services. We expect the life sciences sample management market to remain one of our principal markets for our product and service offerings and provide favorable opportunities for the growth of our overall business. Over the past several years, we have acquired and developed essential capabilities required to strategically address the sample management needs across multiple end markets within the life sciences industry. In October 2017, we acquired all of the outstanding capital stock of 4titude Limited, or 4titude, a U.K.-based manufacturer of scientific consumables for biological sample materials used in a variety of genomic and DNA analytical applications. The acquisition has expanded our existing offerings of consumables and instruments within the Brooks Life Sciences segment. In April 2018, we acquired BioSpeciMan Corporation, or BioSpeciMan, a Canadian provider of storage services for biological sample materials. The acquisition has expanded customer relationships and geographic reach within our growing sample management storage services business. On November 15, 2018, we acquired GENEWIZ Group, or GENEWIZ, a leading global genomics service provider headquartered in South Plainfield, New Jersey. GENEWIZ is a global leader in genomics services that enable research scientists to advance their discoveries within the pharmaceutical, academic, biotechnology, agriculture and other markets. GENEWIZ provides gene sequencing and synthesis services for more than 4,000 institutional customers worldwide supported by their global network of laboratories spanning the United States, China, Japan, Germany and the United Kingdom. This transaction has added a new and innovative platform which we expect to leverage, along with our core capabilities, to add even more value to samples under our care. GENEWIZ is reported within the Brooks Life Sciences segment. Please refer to Note 5, “Acquisitions” in the Notes to the unaudited consolidated financial statements included in Item 1 "Consolidated Financial Statements" of this Quarterly Report on Form 10 Q for further information on these transactions. Since entering the life sciences industry, we have also strengthened and broadened our product portfolio and market reach by investing in internal product development and sales and marketing infrastructure. We expect to continue investing in research and development and making strategic acquisitions and other investments with the objective of expanding our offerings in the life sciences sample management market.

Business and Financial Performance

Three Months Ended March 31, 2019 Compared to Three Months Ended March 31, 2018

Results of Operations - Revenue for the three months ended March 31, 2019 increased to $198.4 million, or by 26%, as compared to the corresponding period of the prior fiscal year. Gross margin was 40.6% for the three months ended March 31, 2019 as compared to 39.7% for the corresponding period of the prior fiscal year, an increase of $18.1 million. Operating expenses were $66.8 million during the three months ended March 31, 2019 as compared to $52.1 million during the corresponding period of the prior fiscal year, an increase of $14.8 million. Operating income was $13.7 million during the second quarter of fiscal year 2019 as compared to $10.3 million for the corresponding period of the prior fiscal year. Loss from continuing operations was $2.8 million for the second quarter of fiscal year 2019, which includes a $9.1 million loss on extinguishment of debt. This compares to income from continuing operations of $62.5 million for the corresponding period of the prior fiscal year, which included the reversal of the valuation allowance reserve against U.S. deferred income tax assets of $58.0 million.

Six Months Ended March 31, 2019 Compared to Six Months Ended March 31, 2018

Results of Operations - Revenue for the six months ended March 31, 2019 increased to $377.8 million, or by 26%, as compared to the corresponding period of the prior fiscal year. Gross margin was 40.4% for the six months ended March 31, 2019 as compared to 38.9% for the corresponding period of the prior fiscal year, an increase of $36.0 million. Operating expenses were $133.6 million during the six months ended March 31, 2019 as compared to $101.4 million during the corresponding period of the prior fiscal year, an increase of $32.2 million. Operating income was $19.0 million during the six months ended March 31, 2019 as compared to $15.2 million for the corresponding period of the prior fiscal year. Income from continuing operations was $3.4 million for the six months ended March 31, 2019

as compared to $64.1 million for the corresponding period of the prior fiscal year. The decrease of $60.7 million was primarily attributable to the reversal of the valuation allowance reserve against U.S. deferred income tax benefits of $58.0 million in the prior fiscal year, and a $9.1 million loss on extinguishment of debt in the 2019 period.

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March 31, 2019 Compared to September 30, 2018

Cash Flows and Liquidity - Cash, cash equivalents and marketable securities were $140.1 million at March 31, 2019 as compared to $251.2 million at September 30, 2018. The decrease in cash and cash equivalents and marketable securities of $111.2 million was primarily attributable to net cash outflows of $442.7 million to acquire GENEWIZ, cash dividends paid of $14.4 million and capital expenditures of $9.7 million, partially offset by net cash inflows primarily from proceeds received from the incremental amendment and syndication of our existing term loan of $334.1 million, proceeds from the sales and maturities of marketable securities of $51.5 million and net cash inflows from operating activities of $22.2 million. Cash inflows from operating activities of $22.2 million was comprised of $48.0 million of net earnings, including net income of $17.8 million and the impact of non-cash related charges of $30.2 million, partially offset by uses of cash of $25.8 million related to the changes in our operating assets and liabilities, net of acquisitions.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our unaudited consolidated financial statements are prepared in accordance with Generally Accepted Accounting Principles, or GAAP. The preparation of the interim consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosure of contingent assets and liabilities. We evaluate our estimates on an ongoing basis, including those related to accounts receivable, inventories, goodwill, intangible assets other than goodwill, long-lived assets, derivative financial instruments, deferred income taxes, warranty obligations, revenue recognized using the percentage of completion method, pension obligations and stock-based compensation expense. We base our estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances. We evaluate current and anticipated worldwide economic conditions, both in general and specifically in relation to the semiconductor and life science industries, that serve as a basis for making judgments about the carrying values of assets and liabilities that are not readily determinable based on information from other sources. Actual results may differ from these estimates under different assumptions or conditions that could have a material impact on our financial condition and results of operations.

For further information with regard to our significant accounting policies and estimates, please refer to Note 2, "Summary of Significant Accounting Policies" in the Notes to the unaudited consolidated financial statements included in Item 1 "Consolidated Financial Statements" of this Quarterly Report on Form 10 Q and in the Notes to our audited consolidated financial statements included in Part II, Item 8 “Financial Statements and Supplementary Data” in our 2018 Annual Report on Form 10 K.

Recently Issued Accounting Pronouncements

For a summary of recently issued accounting pronouncements applicable to our unaudited consolidated financial statements, please refer to Note 2, "Summary of Significant Accounting Policies" in the Notes to the unaudited consolidated financial statements included in Item 1 "Consolidated Financial Statements" of this Quarterly Report on Form 10 Q.

RESULTS OF OPERATIONS

Three and Six Months Ended March 31, 2019 Compared to Three and Six Months Ended March 31, 2018

Revenue

We reported revenue of $198.4 million for the three months ended March 31, 2019, compared to $157.0 million for the corresponding period of the prior fiscal year, an increase of $41.4 million, or 26%. We reported revenue of $377.8 million for the six months ended March 31, 2019, compared to $299.6 million for the corresponding period of the prior fiscal year, an increase of $78.2 million, or 26%. We reported revenue growth in both the Brooks Semiconductor Solutions Group segment and the Brooks Life Sciences segment for both periods. In the first quarter of fiscal 2019, we adopted new accounting guidance for recognizing revenue on a modified retrospective basis. The difference in reported

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revenue due to the adoption of the standard was a net decrease of $1.2 million and $1.6 million during the three and six months ended March 31, 2019, respectively.

Our Brooks Semiconductor Solutions Group segment reported revenue of $112.9 million for the three months ended March 31, 2019 compared to $108.4 million for the corresponding period of the prior fiscal year, an increase of $4.5 million, or 4%. For the six months ended March 31, 2019, our Brooks Semiconductor Solutions Group segment reported revenue of $225.6 million compared to $203.6 million for the corresponding period of the prior fiscal year, an increase of $22.0 million, or 11%. The increase in both periods was primarily driven by increases in sales of contamination control solutions products and automation systems, partially offset by a decline in sales of robotic automation products and automation services. Growth in contamination controls solutions for the three and six months ended March 31, 2019 was $14.2 million and $28.4 million respectively, which is inclusive of revenue from the acquisition of Tec Sem of $5.7 million and $15.1 million, respectively. The semiconductor markets are cyclical and may fluctuate significantly from quarter to quarter. Demand for our Brooks Semiconductor Solution Group products is affected by these cycles. The difference in reported revenue due to the adoption of the new revenue recognition standard was a net increase of $0.2 million and $0.7 million for the three and six months ended March, 31, 2019, respectively.

Our Brooks Life Sciences segment reported revenue of $85.5 million for the three months ended March 31, 2019 compared to $48.5 million for the corresponding period of the prior fiscal year. The increase of $37.0 million, or 76%, was composed of $33.2 million from acquisitions, and $3.8 million from internal growth, principally from consumables and instruments, automated systems and sample storage services. For the six months ended March 31, 2019, our Brooks Life Sciences segment reported revenue of $152.2 million, compared to $96.0 million for the corresponding period of the prior fiscal year. The increase of $56.2 million, or 59%, was composed of $49.8 million from acquisitions, and $6.4 million from internal growth, principally in consumables and instruments, automated systems, and sample management services. The difference in reported revenue due to the adoption of the new revenue recognition standard was a net decrease of $1.4 million and $2.2 million during the three and six months ended March 31, 2019, respectively.

Revenue generated outside the United States was $115.7 million, or 58% of total revenue, for the three months ended March 31, 2019 compared to $96.5 million, or 62% of total revenue, for the corresponding period of the prior fiscal year. Revenue generated outside the United States was $227.0 million, or 60% of total revenue, for the six months ended March 31, 2019 compared to $187.4 million, or 63% of total revenue, for the corresponding period of the prior fiscal year. We had no customers that accounted for 10% or more of our consolidated revenue for each of the three and six months ended March 31, 2019 and 2018.

Gross Margin

We reported gross margins of 40.6% for the three months ended March 31, 2019 compared to 39.7% for the corresponding period of the prior fiscal year. Gross margin increased in the Brooks Semiconductor Solutions Group segment by 0.7 percentage points and in the Brooks Life Sciences segment by 1.4 percentage points in the 2019 period over the 2018 period. We reported gross margins of 40.4% for the six months ended March 31, 2019 compared to 38.9% for the corresponding period of the prior fiscal year. Gross margin increased in the Brooks Semiconductor Solutions Group segment by 0.5 percentage points and in the Brooks Life Sciences segment by 3.7 percentage points in the 2019 period over the 2018 period. Cost of revenue for the three and six months ended March 31, 2019 included $2.8 million and $4.8 million, respectively, of charges for amortization related to completed technology as compared to $1.0 million and $1.9 million, respectively, during the corresponding periods of the prior fiscal year. Cost of revenue for the three and six months ended March 31, 2019 also included $0.0 million and $0.2 million, respectively, of charges related to the inventory step-up in purchase accounting, as compared to $0.0 million and $1.2 million, respectively, during the corresponding periods of the prior fiscal year. Excluding the purchasing accounting impact

related to inventory step-up and the amortization of completed technology, gross margins expanded 1.6 percentage points and 1.7 percentage points, respectively, during the three and six months ended March 31, 2019 as compared to the corresponding periods of the prior fiscal year. The difference in reported gross margin due to the adoption of the new revenue recognition standard was a net decrease in gross profit of $0.7 million and $0.8 million during three and six months ended March 31, 2019, respectively.

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Our Brooks Semiconductor Solutions Group segment reported gross margins of 40.7% for the three months ended March 31, 2019 as compared to 40.1% for the corresponding period of the prior fiscal year. Our Brooks Semiconductor Solutions Group segment reported gross margins of 40.7% for the six months ended March 31, 2019 as compared to 40.3% for the corresponding period of the prior fiscal year. The increase in both periods was driven by lower production costs attributable to product and customer mix and production efficiencies. Cost of revenue for the three and six months ended March 31, 2019 included $0.9 million and $1.9 million, respectively, of charges for amortization related to completed technology as compared to $0.6 million and $1.1 million, respectively, incurred during the corresponding periods of the prior fiscal year. The results for the six months ended March 31, 2019 included $0.2 million of charges related to the inventory step-up in purchase accounting as compared to no such charges during both the corresponding periods of the prior fiscal year. Excluding the purchase accounting impact and the amortization of completed technology, margins expanded 0.9 percentage points and 0.8 percentage points, respectively, during the three and six months ended March 31, 2019 as compared to the corresponding periods of the prior fiscal year. The difference in reported gross margin due to the adoption of the new revenue recognition standard was a net increase in gross profit of $0.2 million and $0.7 million during three and six months ended March 31, 2019, respectively.

Our Brooks Life Sciences segment reported gross margins of 40.4% for the three months ended March 31, 2019 as compared to 39.0% for the corresponding period of the prior fiscal year. Our Brooks Life Sciences segment reported gross margins of 39.9% for the six months ended March 31, 2019 as compared to 36.1% for the corresponding period of the prior fiscal year. The increase during both periods was primarily due to a higher margin revenue mix from GENEWIZ, volume leverage of fixed costs, and higher margins from our consumables and instruments product lines. These factors were partially offset by lower margins on automated store projects due to cost overruns. Cost of revenue for the three and six months ended March 31, 2019 included $1.9 million and $2.9 million, respectively, of charges for amortization related to completed technology as compared to $0.4 million and $0.8 million, respectively, incurred during the corresponding periods of the prior fiscal year. The results for the six months ended March 31, 2018 included $1.2 million of charges related to the inventory step-up in purchase accounting as compared to no such charges during both the corresponding periods of the current fiscal year. Excluding the purchase accounting impact and the amortization of completed technology, margins expanded 2.7 percentage points and 3.6 percentage points, respectively, during the three and six months ended March 31, 2019 as compared to the corresponding periods of the prior fiscal year. The difference in reported gross margin due to the adoption of the new revenue recognition standard was a net decrease in gross profit of $0.9 million and $1.2 million during three and six months ended March 31, 2019, respectively.

Research and Development

Research and development expenses were $14.1 million and $27.2 million, respectively, during the three and six months ended March 31, 2019 as compared to $11.3 million and $22.8 million, respectively, during the corresponding periods of the prior fiscal year. The increase of $2.8 million during the second quarter of fiscal year 2019 as compared to the corresponding period of fiscal year 2018 reflects higher expense of $1.8 million within the Brooks Life Sciences segment and $1.0 million within the Brooks Semiconductor Solutions Group segment. The increase of $4.4 million during the first half of fiscal year 2019 reflects higher expense of $2.5 million within the Brooks Life Sciences segment and $1.9 million within the Brooks Semiconductor Solutions Group segment. Higher expenses in both periods were primarily attributable to new acquisitions and higher employee related costs.

Selling, General and Administrative

Selling, general and administrative expenses were $52.4 million and $105.9 million, respectively, during the three and six months ended March 31, 2019 as compared to $40.7 million and $78.6 million, respectively, during the corresponding periods of the prior fiscal year. The increase of 11.7 million for the three months ended March 31, 2019

compared to the corresponding period of the prior year was primarily attributable to the selling, general and administrative infrastructure at GENEWIZ, and amortization expense related to intangible assets acquired in connection with the acquisitions of GENEWIZ and Tec Sem. The prior year corresponding period also included a $1.1 million credit, related to an insurance claim. These impacts were partially offset by lower expense accruals in 2019 related to variable compensation and lower merger and acquisition related expenses. In addition to the factors mentioned above, additional merger-related costs drove the increase of $27.3 million during the six months ended March 31, 2019 compared to the corresponding period of the prior fiscal year.

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Amortization expense related primarily to customer relationships was $6.6 million and $12.4 million, respectively, during the three and six months ended March 31, 2019 as compared to $4.6 million and $9.2 million, respectively, during the corresponding periods of the prior fiscal year. Merger-related costs were $0.0 million and $6.4 million, respectively, during the three and six months ended March 31, 2019 as compared to $1.6 million and $2.3 million, respectively, during the corresponding periods of the prior fiscal year. The increases in amortization expense and merger costs during 2019 are due to the acquisition of GENEWIZ.

Non-Operating Income (Expenses)

Interest income - During the three and six months ended March 31, 2019, we recorded interest income of $0.3 million and $0.8 million, respectively, as compared to $0.4 million and $0.5 million, respectively, during the corresponding periods of the prior fiscal year.

Interest expense - During the three and six months ended March 31, 2019, we recorded interest expense of $8.0 million and $13.3 million, respectively, as compared to $2.2 million and $4.4 million during corresponding periods of the prior fiscal year. The increase in interest expense is due to interest on the $350.0 million incremental term loan secured in the first quarter of fiscal year 2019 used to pay a portion of the purchase price for our acquisition of GENEWIZ.

Loss on extinguishment of debt - During the three and six months ended March 31, 2019, the Company recorded a loss on extinguishment of debt of $9.1 million in connection with the syndication of the $350.0 million term loan secured during the first quarter of fiscal 2019. The syndication to a new group of lenders during the second quarter of fiscal 2019 met the criteria of a debt extinguishment and therefore the amortization of the deferred financing costs associated with the origination of the loan was accelerated and recorded as a loss on extinguishment of debt on our statement of operations.

Other expenses, net - During the three and six months ended March 31, 2019, we recorded other expenses, net of $0.8 million and $0.8 million, respectively, as compared to $0.5 million and $2.4 million, respectively, of the corresponding periods of the prior fiscal year. The $1.6 million decrease during the six months ended March 31, 2019 as compared to the corresponding period of fiscal 2018 was primarily attributable to lower foreign currency exchange losses.

Income Tax Provision

We recorded an income tax benefit of $1.0 million and $6.9 million, respectively, during the three and six months ended March 31, 2019. The tax benefit for three months was driven by U.S. losses during the period and includes $0.4 million of stock compensation windfalls. These benefits were slightly offset by the tax provision on foreign earnings during the period and a discrete expense related to interest accruing on uncertain tax positions. The tax benefit for the six months ended March 31, 2019 was primarily driven by discrete benefits related to stock compensation windfalls of $4.1 million for tax deductions that exceeded the associated compensation expense, $1.4 million of tax benefits related to the remeasurement of net U.S. deferred tax assets due to state tax rate changes, and a $1.1 million transition tax reduction. These discrete benefits were slightly increased by the tax benefit recorded on losses during the period.

We recorded an income tax benefit of $54.5 million and $55.2 million, respectively, during the three and six months ended March 31, 2018. The tax benefit recorded during each period was primarily driven by a discrete benefit due to the reversal of a valuation allowance against U.S. net deferred tax assets during the three months ended March 31, 2018 in the amount of $58.0 million. The tax benefit for the six months ended March 31, 2018 included $0.7 million of tax benefits related to the re-measurement of net U.S. deferred tax liabilities to account for the reduced 21 percent

statutory federal income tax rate. This benefit for the three and six months ended March 31, 2018 was partially offset by the tax provisions related to foreign income.

During 2018, the Internal Revenue Service issued proposed regulations on the federal toll charge and various other aspects of the Tax Cuts and Jobs Act. We finalized our analysis of the toll charge and related liabilities, including

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uncertain tax positions, during the three months ended December 31, 2018 pursuant to U.S. Securities and Exchange Commission ("SEC") Staff Accounting Bulletin No. 118. As a result of the new guidance issued and additional work to complete the calculation of our federal toll charge, we reduced our provisional accrual for federal, state and foreign taxes by net $1.1 million during the three months ended December 31, 2018. In addition, we also assessed our uncertain tax positions related to these taxes and accrued income and determined no tax reserves were required.

We evaluate the realizability of our deferred tax assets by tax-paying component and assess the need for a valuation allowance on an annual and quarterly basis. We evaluate the profitability of each tax-paying component on a historic cumulative basis and a forward-looking basis while performing this analysis. We evaluated all positive and negative evidence in concluding it was appropriate to release the majority of the valuation allowance against U.S. net deferred tax assets during fiscal year 2018. The remaining portion of our U.S. valuation allowance is related to the realizability of certain state tax credits and net operating loss carry-forwards. We continue to maintain valuation allowances against net deferred tax assets in certain foreign tax-paying components as of March 31, 2019.

We maintain liabilities for uncertain tax positions. These liabilities involve judgment and estimation and are monitored based on the best information available. We recognize interest related to unrecognized benefits as a component of the income tax benefit. We recognized interest as tax expense related to our unrecognized tax benefits of $0.4 million and $0.5 million, respectively, during the three and six months ended March 31, 2019. During the six months ended March 31, 2018 the statute of limitations lapsed on an uncertain tax positions in a foreign jurisdiction which resulted in a $0.3 million reduction in the gross unrecognized tax benefits that impacted the effective tax rate.

We are subject to U.S. federal income tax and state, local and international income taxes in various jurisdictions. The amount of income taxes paid is subject to our interpretation of applicable tax laws in the jurisdictions in which we file tax returns. In the normal course of business, we are subject to income tax audits in various global jurisdictions in which we operate. The years subject to examination vary for the U.S. and international jurisdictions, with the earliest tax year being 2011. Based on the outcome of these examinations or the expiration of statutes of limitations for specific jurisdictions, it is reasonably possible that the related unrecognized tax benefits could change from those recorded in our unaudited Consolidated Balance Sheets. We currently anticipate that it is reasonably possible that the unrecognized tax benefits will be reduced by approximately $0.1 million within the next twelve months.

Discontinued Operations

We generated revenue and net income from discontinued operations of $35.7 million and $6.3 million, respectively for the three months ended March 31, 2019 related to our semiconductor cryogenics business as compared to $50.3 million and $4.5 million, respectively, for the corresponding period of fiscal 2018. We generated revenue and net income from discontinued operations of $75.0 million and $14.4 million, respectively for the six months ended March 31, 2019 related to our semiconductor cryogenics business as compared to $97.0 million and $19.4 million, respectively, for the corresponding period of fiscal 2018. The net income includes income from the Ulvac Cryogenics, Inc. joint venture during these periods. The income from discontinued operations only includes direct operating expenses incurred that (1) are clearly identifiable as costs being disposed of upon completion of the sale and (2) will not be continued by the Company on an ongoing basis. Indirect expenses which supported the Cryogenics business, and which will remain as part of the continuing operations, are not reflected in income from discontinued operations.

LIQUIDITY AND CAPITAL RESOURCES

A considerable portion of our revenue is dependent on the demand for semiconductor capital equipment which historically has experienced periodic downturns. We believe that we have adequate resources to satisfy our working capital, financing activities, debt service and capital expenditure requirements for the next twelve months. The cyclical nature of our served markets and uncertainty in the current global economic environment make it difficult for

us to predict longer-term liquidity requirements with sufficient certainty. We may be unable to obtain any required additional financing on terms favorable to us, if at all. If adequate funds are not available to us on acceptable terms or otherwise, we may be unable to successfully develop or enhance products and services, respond to competitive pressure or take advantage of acquisition opportunities, any of which could have a material adverse effect on our business, financial condition and operating results.

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The discussion of our cash flows and liquidity that follows does not include the impact of the disposition of our cryogenics business and is stated on a total company consolidated basis.

Overview of Cash Flows and Liquidity

Our cash, cash equivalents and marketable securities as of March 31, 2019 and September 30, 2018 consist of the following (in thousands):

	March 31, 2019	September 30, 2018
Cash and cash equivalents	$ 137,217	$ 197,708
Short-term marketable securities	47	46,281
Long-term marketable securities	2,795	7,237
	$ 140,059	$ 251,226

Our cash is held in numerous locations throughout the world. As of March 31, 2019, we had cash and cash equivalents of $137.2 million, of which $111.1 million was held outside of the United States. If these funds are needed for the U.S. operations, we would need to repatriate these funds. As a result of recent changes in U.S. tax legislation, any repatriation in the future would likely not result in further U.S. federal income tax. Our intent is to permanently reinvest these funds outside of the U.S. and our current operating plans do not demonstrate a need to repatriate these funds for our U.S. operations. As of March 31, 2019 and September 30, 2018, we had marketable securities of $2.8 million and $53.5 million, respectively. Our marketable securities are generally readily convertible to cash without an adverse impact.

Six Months Ended March 31, 2019 Compared to Six Months Ended March 31, 2018

Overview

Cash, cash equivalents and marketable securities were $140.1 million at March 31, 2019 as compared to $251.2 million at September 30, 2018. The decrease in cash and cash equivalents and marketable securities of $111.2 million was primarily attributable to net cash outflows of $442.7 million to acquire GENEWIZ, cash dividends paid of $14.4 million and capital expenditures of $9.7 million, partially offset by net cash inflows primarily from proceeds received from the incremental amendment and syndication of our existing term loan of $334.1 million, proceeds from the sales and maturities of marketable securities of $51.5 million and net cash inflows from operating activities of $22.2 million during the six months ended March 31, 2019.

Operating Activities

Cash flows from operating activities can fluctuate significantly from period to period as earnings, working capital needs and the timing of payments for income taxes, restructuring activities and other operating charges impact reported cash flows.

Cash provided by operating activities was $22.2 million during the six months ended March 31, 2019, comprised primarily of earnings of $48.0 million, including net income of $17.8 million and the impact of non-cash related charges of $30.2 million. Partially offsetting these items were the uses of cash of $25.8 million related to the changes in our operating assets and liabilities. The changes in operating assets and liabilities that resulted in a use of cash consisted primarily of an increase in accounts receivable as a result of higher revenue, an increase in inventory levels

to support the growth of our business and a decrease in accrued compensation and tax withholdings as a result of year-end cash incentive bonus payments. These uses of cash were partially offset by sources of cash related primarily to increases in accounts payable. Cash provided by operating activities was $23.4 million during the six months ended March 31, 2018 comprised primarily of earnings of $57.6 million, including net income of $83.5 million and the unfavorable impact of non-cash related charges of $25.9 million, partially offset by the use of $34.2 million related to the changes in our operating assets and liabilities.

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Investing Activities

Cash flows from investing activities consist primarily of cash used for acquisitions, capital expenditures and purchases of marketable securities as well as cash proceeds generated from sales and maturities of marketable securities. Cash used in investing activities was $402.2 million during the six months ended March 31, 2019 as compared to $119.9 million during the corresponding period of the prior fiscal year. Cash used in investing activities during the six months ended March 31, 2019 included cash outflow of $442.7 million for the acquisition of GENEWIZ, $9.7 million of capital expenditures, and $1.3 million for the purchases of marketable securities, partially offset by cash inflows from the proceeds of sales and maturities of marketable securities of $51.5 million. Cash used in investing activities during the six months ended March 31, 2018 included cash payments of $65.0 million for acquisitions, $49.6 million for the purchases of marketable securities and $5.7 million of capital expenditures.

Financing Activities

Cash provided by financing activities was $320.0 million during the six months ended March 31, 2019 as compared to $184.0 million during the corresponding period of the prior fiscal year. Cash provided by financing activities during the six months ended March 31, 2019 included net cash inflows of $334.1 million primarily related to net proceeds from the incremental term loan secured in November 2018 and the syndication of the incremental term loan in February 2019, partially offset by cash dividend payments of $14.4 million. Cash provided by financing activities during the first half of fiscal year 2018 included cash inflows of $197.6 million related to proceeds from the term loan originated in October 2017, partially offset by cash dividend payments of $14.1 million and principal payments of $0.5 million.

China Facility

In April 2019, the Company committed to construct a facility in Suzhou China, to consolidate the Suzhou operations of its GENEWIZ business and provide an infrastructure to support future growth. The facility will be constructed in two phases. The company expects to incur $50.0 to $55.0 million of capital expenditures over the next five years, of which up to $10.0 million is expected to be incurred during 2019.

Capital Resources

Senior Secured Term Loan Facility

On October 4, 2017, we entered into a $200.0 million term loan with Morgan Stanley Senior Funding, Inc., JPMorgan Chase Bank, N.A. and Wells Fargo Securities, LLC. The term loan was issued at $197.6 million, or 98.8% of its par value, resulting in a discount of $2.4 million, or 1.2%, which represented loan origination fees paid at the closing. On November 15, 2018, we entered into an incremental amendment, or the Amendment to the existing credit agreement. Under the Amendment, we obtained an incremental term loan in an aggregate principal amount of $350.0 million. The proceeds of the incremental loan were used to pay a portion of the purchase price for our acquisition of GENEWIZ acquisition. The term loan was issued at $340.5 million, or 97.3% of its par value, resulting in a discount of $9.5 million, or 2.7%, which represented financing cost of the loan. Except as provided in the Amendment, the incremental loan is subject to the same terms and conditions as set forth in the existing credit agreement. The loan principal amount may be increased by an aggregate amount equal to $75.0 million plus any voluntary repayments of the term loans plus any additional amount such that the secured leverage ratio of the Company is less than 3.00 to 1.00.

On February 15, 2019, we syndicated the $350.0 million term loan to a group of new lenders which met the criteria of a debt extinguishment. We wrote off the carrying value of the incremental term loan of $340.1 million as of February 15, 2019 and recorded the syndicated incremental term loan at its present value for $349.1 million and a loss on debt

extinguishment for $9.1 million. The syndicated loan was issued at $345.2 million, or 98.9% of its part value resulting in a discount of $4.0 million which represented financing costs which are presented as a reduction of the term loan principal balance in the accompanying unaudited Consolidated Balance Sheets and will be accreted over the life of the loan. Except as provided in the Amendment for increase of interest rates, the new loan is subject to the same terms and conditions as set forth in the incremental term loan.

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The term loans mature and becomes fully payable on October 4, 2024. Installment principal payments equal to 0.25% of the initial principal amount of the term loan are payable on the last day of each quarter, with any remaining principal amount becoming due and payable on the maturity date. During the six months ended March 31, 2019, we made principal payments of $3.2 million related to the term loans. Subject to certain conditions stated in the term loan agreement, we may redeem the term loans at any time at our option without a significant premium or penalty, except for a repricing transaction, as defined in the original term loan agreement and the Amendment. We would also be required to redeem the term loan at the principal amounts then outstanding upon the occurrence of certain events, as set forth in the original term loan agreement and the Amendment.

In connection with the GENEWIZ acquisition, we assumed three five-year term loans and two one-year term loans. At March 31, 2019, we had an aggregate outstanding principal balance of $3.9 million for these term loans.

At March 31, 2019, the aggregate outstanding principal balance of the term loans was $543.5 million, excluding unamortized deferred financing costs of $6.1 million. Borrowings under the term loan bear variable interest rates. As a result, we may experience exposure to interest rate risk due to the potential volatility associated with the variable interest rates on the term loan. If rates increase, we may be subject to higher costs of servicing the loan which could reduce our profitability and cash flows. During the six months ended March 31, 2019, the weighted average stated interest rate on the term loan was 5.2%. During the six months ended March 31, 2019, we incurred aggregate interest expense of $12.3 million on the term loans. Our debt service requirements are expected to be funded through our existing sources of liquidity and operating cash flows.

The term loan agreement and the Amendment contain certain customary representations and warranties, covenants and events of default. As of March 31, 2019, we were in compliance with all covenants and conditions under the term loan agreement.

Line of Credit

Facility

We maintain a revolving line of credit with Wells Fargo Bank, N.A. and JPMorgan Chase Bank, N.A that provides for revolving credit financing of up to $75.0 million, subject to borrowing base availability, as defined in the credit agreement. The line of credit matures on October 4, 2022. The proceeds from the line of credit are available for permitted acquisitions and general corporate purposes.

As of March 31, 2019, we had approximately $51.3 million available for borrowing under the line of credit. There were no amounts outstanding pursuant to the line of credit as of March 31, 2019. The amount of funds available for borrowing under the line of credit arrangement may fluctuate each period based on our borrowing base availability. The line of credit contains certain customary representations and warranties, a financial covenant, affirmative and negative covenants, as well as events of default. We were in compliance with the line of credit covenants as of March 31, 2019. Although we believe we will be able to generate sufficient cash in the United States and foreign jurisdictions to fund future operating costs, we secured the revolving line of credit as an additional assurance for maintaining liquidity in the United States during potentially severe downturns of the cyclical semiconductor market, and for strategic investments or acquisitions.

Shelf Registration Statement

On July 27, 2016, we filed a registration statement on Form S-3 with the SEC to sell securities, including common stock, preferred stock, warrants, debt securities, depositary shares, purchase contracts and purchase units in amounts to be determined at the time of an offering. Any such offering, if it does occur, may happen in one or more transactions.

The specific terms of any securities to be sold will be described in supplemental filings with the SEC. This registration statement will expire on July 27, 2019.

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Dividends

On April 26, 2019, the Company's Board of Directors declared a cash dividend of $0.10 per share payable on June 28, 2019 to common stockholders of record as of June 7, 2019. Dividends are declared at the discretion of our Board of Directors and depend on actual cash flow from operations, our financial condition, debt service and capital requirements, and any other factors our Board of Directors may consider relevant. We intend to pay quarterly cash dividends in the future; however, the amount and timing of these dividends may be impacted by the cyclical nature of certain markets we serve. We may reduce, delay or cancel a quarterly cash dividend based on the severity of a cyclical downturn.

Share Repurchase Program

On September 29, 2015, our Board of Directors approved a share repurchase program for up to $50.0 million worth of our common stock. The timing and amount of any shares repurchased will be based on market and business conditions, legal requirements and other factors and repurchases may be commenced or suspended at any time at our discretion. There were no shares repurchased under this program during the six months ended March 31, 2019 and there have been no shares repurchased under this program since its inception.

Contractual Obligations and Requirements

Our non-cancellable inventory purchase commitments were $88.3 million at March 31, 2019.

At March 31, 2019, we had approximately $1.3 million of letters of credit outstanding related primarily to customer advances and other performance obligations. These arrangements guarantee the refund of advance payments received from our customers in the event that the product is not delivered or warranty obligations are not fulfilled in accordance with the contract terms. These obligations could be called by the beneficiaries at any time before the expiration date of the particular letter of credit if we fail to meet certain contractual requirements. None of these obligations were called during the six months ended March 31, 2019, and we currently do not anticipate any of these obligations to be called in the near future.

Off-Balance Sheet Arrangements

As of March 31, 2019, we did not have any off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

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Item 3. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to a variety of market risks, including fluctuations in foreign currency exchange rates and changes in interest rates affecting interest payments on our term loan and investment return on our cash, cash equivalents and marketable securities.

Interest Rate Exposure

Our term loans bear variable interest rates which subject us to interest rate risk. Our primary interest rate risk exposure results from changes in the short-term LIBOR rate, the federal funds effective rate and the prime rate. As of March 31, 2019, the weighted average stated interest rate on the term loans was 5.2%. At March 31, 2019, the outstanding term loans principal balance was $543.5 million, net of unamortized deferred financing costs of $6.1 million. During the six months ended March 31, 2019, we incurred cash interest expense of $12.3 million on the term loans. A hypothetical 100 basis point change in interest rates would result in a $2.5 million change in interest expense incurred during the six months ended March 31, 2019.

Our cash and cash equivalents consist principally of money market securities that are short-term in nature. At March 31, 2019, our total short-term and long-term investments were $2.8 million, consisting mostly of highly rated corporate debt securities and other debt securities. At March 31, 2019, we had no securities in unrealized losses position. A hypothetical 100 basis point change in interest rates would result in insignificant increase in interest income earned during the six months ended March 31, 2019.

Currency Rate Exposure

We have transactions and balances denominated in currencies other than the U.S. dollar. Most of these transactions or balances are denominated in Euros, British Pounds and a variety of Asian currencies. Sales in currencies other than the U.S. dollar were approximately 37% and 33% of our total sales, respectively, during the six months ended March 31, 2019 and 2018. These sales were made primarily by our foreign subsidiaries, which have cost structures that substantially align with the currency of sale.

In the normal course of our business, we have liquid assets denominated in non-functional currencies which include cash, short-term advances between our legal entities and accounts receivable which are subject to foreign currency exposure. Such balances were approximately $140.5 million and $84.7 million, respectively, at March 31, 2019 and September 30, 2018, and related to the Euro, British Pound and a variety of Asian currencies. We mitigate the impact of potential currency translation losses on these short-term intercompany advances by the timely settlement of each transaction, generally within 30 days. We also utilize forward contracts to mitigate our exposures to currency movement. We incurred foreign currency losses of $0.6 million and $2.5 million, respectively, during the six months ended March 31, 2019 and 2018, which related to the currency fluctuation on these balances between the time the transaction occurred and the ultimate settlement of the transaction. A hypothetical 10% change in foreign exchange rates at March 31, 2019 and 2018 would result in an approximate change of $2.8 million and $2.1 million, respectively, in our net income during the six months ended March 31, 2019 and 2018.

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Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures. As of the end of the period covered by this report, and pursuant to Rules 13a 15(e) and 15d 15(e) under the Securities Exchange Act of 1934, the Company's management, including our chief executive officer and chief financial officer, has concluded that our disclosure controls and procedures are effective.

Change in Internal Controls. There were no changes in our internal control over financial reporting that occurred during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. We implemented internal controls to ensure we adequately evaluated our contracts and properly assessed the impact of the new accounting standards related to revenue recognition on our financial statements to facilitate their adoption on October 1, 2018. There were no significant changes to our internal control over financial reporting due to the adoption of the new standard.

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PART II. OTHER INFORMATION

Item 1. Legal Proceedings

We are subject to various legal proceedings, both asserted and unasserted, that arise in the ordinary course of business. We cannot predict the ultimate outcome of such legal proceedings or in certain instances provide reasonable ranges of potential losses. However, as of the date of this Quarterly Report on Form 10 Q, we believe that none of these claims will have a material adverse effect on our consolidated financial condition or results of operations. In the event of unexpected subsequent developments and given the inherent unpredictability of these legal proceedings, there can be no assurance that our assessment of any claim will reflect the ultimate outcome and an adverse outcome in certain matters could, from time-to-time, have a material adverse effect on our consolidated financial condition or results of operations in particular quarterly or annual periods.

Item 1A. Risk Factors

You should carefully review and consider the information regarding certain factors that could materially affect our business, consolidated financial condition or results of operations set forth under Item 1A. Risk Factors in our 2018 Annual Report on Form 10 K. There have been no material changes from the risk factors disclosed in our 2018 Annual Report on Form 10 K. We may disclose changes to risk factors or additional factors from time to time in our future filings with the SEC.

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

Share Repurchase Program

On September 29, 2015, our Board of Directors approved a share repurchase program for up to $50.0 million worth of our common stock. The timing and amount of any shares repurchased are based on market and business conditions, legal requirements and other factors and repurchases may be commenced or suspended at any time at our discretion. There were no shares repurchased under this program during the six months ended March 31, 2019.

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Item 6. Exhibits

The following exhibits are included herein:

Exhibit No.	Description
10.01	Incremental Amendment, dated as of November 15, 2018, to that certain Credit Agreement dated as of October 4, 2017, among Brooks Automation, Inc., the several lenders party thereto from time to time and Morgan Stanley Senior Funding, Inc., as administrative agent for the Lenders (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on November 15, 2018).
31.01	Certification of the Company's Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.02	Certification of the Company's Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32	Certification of the Company's Chief Executive Officer and Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101	The following material from the Company's Quarterly Report on Form 10 Q, for the quarter ended March 31, 2019, formatted in XBRL (eXtensible Business Reporting Language): (i) the unaudited Consolidated Balance Sheets; (ii) the unaudited Consolidated Statements of Operations; (iii) the unaudited Consolidated Statements of Comprehensive Income; (iv) the unaudited Consolidated Statements of Cash Flows; and (v) the Notes to the unaudited Consolidated Financial Statements.

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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.

BROOKS AUTOMATION, INC.

Date: May 3, 2019 /s/ Lindon G. Robertson
Lindon G. Robertson
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)

Date: May 3, 2019 /s/ David Pietrantoni
David Pietrantoni
Vice President-Finance and Corporate Controller
(Principal Accounting Officer)