LITHIA MOTORS INC
Form SC 13G/A
February 12, 2004

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

SCHEDULE 13G
(Rule 13d-102)

INFORMATION TO BE INCLUDED IN STATEMENTS FILED PURSUANT
TO RULES 13d-1(b),(c), AND (d) AND AMENDMENTS THERETO FILED
PURSUANT TO RULE 13d-2(b)
(Amendment No. 3)1

Lithia Motors, Inc.

(Name of Issuer)

Class A Common Stock

(Title of Class of Securities)

536797103

(CUSIP Number)

12/31/2003

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

[X] Rule 13d-1(b)
[_] Rule 13d-1(c)
[_] Rule 13d-1(d)

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1 The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 (the "Act") or otherwise subject to the liabilities of that section of the Act, but shall be subject to all other provisions of the Act (however, see the Notes.)

(Continued on following pages)

1.	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NO. OF ABOVE PERSONS (ENTITIES ONLY) Wellington Management Company, LLP 04-2683227	
2.	CHECK THE APPROPRIATE BOX IF THE MEMBER OF A GROUP*	(a) [_] (b) [_]
3.	SEC USE ONLY	
4.	CITIZENSHIP OR PLACE OF ORGANIZATION Massachusetts	

NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5.	SOLE VOTING POWER 0
	6.	SHARED VOTING POWER 564,000
	7.	SOLE DISPOTIVE POWER 0
	8.	SHARED DISPOTIVE POWER 1,190,400

9.	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,190,400	
10.	CHECK BOX IF AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES*	[_]
11.	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9 8.103%	
12.	TYPE OF REPORTING PERSON HC,IA	

Item 1(a). Name of Issuer:

Lithia Motors, Inc.

Item 1(b). Address of Issuer's Principal Executive Offices:

360 East Jackson Street
Medford, OR 97501

Item 2(a). Name of Person Filing:

Wellington Management Company, LLP(''WMC'')

Item 2(b). Address of Principal Business Office or, if None, Residence:

75 State St
Boston, MA 02109

Item 2(c). Citizenship:

Massachusetts

Item 2(d). Title of Class of Securities:

Class A Common Stock

Item 2(e). CUSIP Number:

536797103

Item 3. If This Statement is Filed Pursuant to Rule 13d-1(b), or 13d-2(b) or (c), Check Whether the Person Filing is a:

(a) [ ] Broker or dealer registered under Section 15 of the Act.

(b) [ ] Bank as defined in Section 3(a)(6) of the Act.

(c) [ ] Insurance Company as defined in Section 3(a)(19) of the Act.

(d) [ ] Investment Company registered under Section 8 of the Investment Company Act.

(e) [X] An investment adviser in accordance with Rule 13d-1(b)(1)(ii)(E);

(f) [ ] An employee benefit plan or endowment fund in accordance with Rule 13d-1(b)(1)(ii)(F);

(g) [X] A parent holding company or control person in accordance with Rule 13d-1(b)(1)(ii)(G); see item 7;

(h) [ ] A savings association as defined in Section 3(b) of the Federal Deposit Insurance Act;

(i) [ ] A church plan that is excluded from the definition of an investment company under Section 3(c)(14) of the Investment Company Act;

(j) [ ] Group, in accordance with Rule 13d-1(b)(1)(ii)(J).

If this statement is filed pursuant to Rule 13d-1(c), check this box [ ]

Item 4. Ownership.
Provide the following information regarding the aggregate number and percentage of the class of securities of the issuer identified in Item 1.

(a) Amount Beneficially Owned: WMC, in its capacity as investment adviser, may be deemed to beneficially own 1,190,400 shares of the Issuer which are held of record by clients of WMC.

(b) Percent of Class: 8.103%

(c) Number of shares as to which such person has:

(i)	sole power to vote or to direct the vote	0
(ii)	shared power to vote or to direct the vote	564,000
(iii)	sole power to dispose or to direct the disposition of	0
(iv)	shared power to dispose or to direct the disposition of	1,190,400

Item 5. Ownership of Five Percent or Less of Class.
If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following

[ ]

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

The securities as to which this Schedule is filed by WMC, in its capacity as investment adviser, are owned of record by clients of WMC. Those clients have the right to receive, or the power to direct the receipt of, dividends from, or the proceeds from the sale of, such securities. No such client is known to have such right or power with respect to more than five percent of this class of securities, except as follows:

None

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company.

See Exhibit A

Item 8. Identification and Classification of Members of the Group.

Not Applicable. This schedule is not being filed pursuant to Rule 13d-1(b)(1)(ii)(J) or Rule 13d-1(d).

Item 9. Notice of Dissolution of Group.

Not Applicable

Item 10. Certification.

(a) The following certification shall be included if the statement is filed pursuant to Rule 13d-1(b):

"By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired and are held in the ordinary course of business and were not acquired and are not held for the purpose of or with the

effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection withor as a participant in any transaction having that purpose or effect. "

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

By: --//Brian P. Hillery//--

Name: Brian P. Hillery
Title: Vice President
Date: February 13, 2004

*Signed pursuant to a Power of Attorney dated January 17, 2002 and filed with the SEC on February 5, 2002.

Exhibit A

Pursuant to the instructions in Item 7 of this Schedule 13G, the identity and the Item 3 classification of the relevant subsidiary are: Wellington Trust Company, NA, 75 State Street, Boston MA 02109, a wholly-owned subsidiary of Wellington Management Company, LLP and a bank as defined in Section 3(a)(6) of the Securities Exchange Act of 1934.

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24,808

Current liabilities held for sale

7,388

7,825

Total current liabilities

164,617

146,778

Long-term debt

194,071

—

Long-term tax reserves

1,102

1,687

Long-term deferred tax liabilities

7,135

3,748

Long-term pension liabilities

4,255

1,783

Other long-term liabilities

5,547

4,336

Non-current liabilities held for sale

698

652

Total liabilities

377,425

158,984

Commitments and contingencies (Note 22)

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, 84,164,130 shares issued and 70,702,261 shares outstanding at September 30, 2018, 83,294,848 shares issued and 69,832,979 shares outstanding at September 30, 2017

841

833

Additional paid-in capital

1,898,434

1,874,918

Accumulated other comprehensive income

13,587

15,213

Treasury stock, at cost- 13,461,869 shares

(200,956)

(200,956)

Accumulated deficit

(994,074)

(1,082,364)

Total stockholders' equity

717,832

607,644

Total liabilities and stockholders' equity

$

1,095,257

$

766,628

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

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended September 30,		
	2018	2017	2016
	(In thousands, except per share data)		
Revenue			
Products	$ 482,389	$ 406,986	$ 335,923
Services	149,171	120,513	98,089
Total revenue	631,560	527,499	434,012
Cost of revenue			
Products	288,323	249,396	212,029
Services	97,156	79,216	65,294
Total cost of revenue	385,479	328,612	277,323
Gross profit	246,081	198,887	156,689
Operating expenses			
Research and development	46,936	39,875	44,241
Selling, general and administrative	167,022	141,549	119,292
Restructuring charges	714	3,144	10,210
Total operating expenses	214,672	184,568	173,743
Operating income (loss)	31,409	14,319	(17,054)
Interest income	1,881	464	452
Interest expense	(9,520)	(408)	(157)
Gain on settlement of equity method investment	—	1,847	—
Other expenses, net	(3,304)	(1,702)	(1,383)
Income (loss) before income taxes and earnings of equity method investments	20,466	14,520	(18,142)
Income tax provision (benefit)	(47,251)	3,380	66,250
Income (loss) before equity in earnings of equity method investments	67,717	11,140	(84,392)
Equity in earnings of equity method investments	—	(453)	(1,065)
Income (loss) from continuing operations	67,717	10,687	(85,457)
Income from discontinued operations, net of tax	48,747	51,925	15,981
Net income (loss)	$ 116,464	$ 62,612	$ (69,476)
Net loss attributable to noncontrolling interest	111	—	—
Net income (loss) attributable to Brooks Automation, Inc.	$ 116,575	$ 62,612	$ (69,476)
Basic net income (loss) per share attributable to Brooks Automation, Inc. common stockholders:			
Income (loss) from continuing operations	$ 0.96	$ 0.15	$ (1.25)
Income from discontinued operations, net of tax	0.69	0.75	0.23
Basic net income (loss) per share	$ 1.65	$ 0.90	$ (1.01)
Diluted net income (loss) per share attributable to Brooks Automation, Inc. common stockholders:			
Income (loss) from continuing operations	$ 0.95	$ 0.15	$ (1.25)
Income from discontinued operations, net of tax	0.69	0.74	0.23
Diluted net income (loss) per share	$ 1.64	$ 0.89	$ (1.01)
Dividend declared per share	$ 0.40	$ 0.40	$ 0.40

Weighted average shares used in computing net income per share:			
Basic	70,489	69,575	68,507
Diluted	70,937	70,485	68,507

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

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

	Year Ended September 30,		
	2018	2017	2016
	(In thousands)		
Net income (loss)	$ 116,464	$ 62,612	$ (69,476)
Other comprehensive (loss) income, net of tax:			
Cumulative foreign currency translation adjustments	(1,651)	(221)	8,844
Unrealized (losses) gains on marketable securities, net of tax effects of $0, $0 and $58 for fiscal years 2018, 2017 and 2016	(111)	2	(106)
Actuarial gains (losses), net of tax effects of ($49), ($74) and $161 for fiscal years 2018, 2017 and 2016	136	525	(322)
Pension settlement	—	(259)	—
Pension curtailment	—	—	852
Total other comprehensive (loss) income, net of tax	(1,626)	47	9,268
Comprehensive loss attributable to noncontrolling interest	111	—	—
Comprehensive income (loss)	$ 114,949	$ 62,659	$ (60,208)

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

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended September 30,		
	2018	2017	2016
	(In thousands)		
Cash flows from operating activities			
Net income (loss)	$ 116,464	$ 62,612	$ (69,476)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	37,429	28,149	28,046
Gain on settlement of equity method investment	—	(1,847)	—
Impairment of other assets	—	—	807
Stock-based compensation	19,822	17,278	11,737
Amortization of premium on marketable securities and deferred financing costs	710	252	339
Earnings of equity method investments	(6,788)	(9,381)	(2,380)
Loss recovery on insurance claim	(1,103)		
Deferred income tax benefit	(45,217)	517	70,273
Pension settlement	—	(259)	—
Other gains on disposals of assets	(758)	(406)	(41)
Changes in operating assets and liabilities, net of acquisitions:			
Accounts receivable	(28,463)	(11,178)	(1,796)
Inventories	(24,365)	(12,792)	8,565
Prepaid expenses and other current assets	(3,676)	(5,829)	(428)
Accounts payable	5,457	7,846	(5,143)
Deferred revenue	2,791	8,049	(3,290)
Accrued warranty and retrofit costs	(157)	1,602	290
Accrued compensation and tax withholdings	5,978	5,565	(3,234)
Accrued restructuring costs	(1,080)	(4,241)	3,860
Accrued pension costs	—	(32)	(811)
Accrued expenses and other current liabilities	(3,080)	10,319	2,229
Net cash provided by operating activities	73,964	96,224	39,547
Cash flows from investing activities			
Purchases of property, plant and equipment	(12,787)	(12,677)	(12,848)
Purchases of technology intangibles	—	(240)	—
Purchases of marketable securities	(69,692)	—	(12,901)
Sales of marketable securities	1,584	3,590	139,388
Maturities of marketable securities	17,482	—	—
Proceeds from divestitures	—	—	—
Disbursement for a loan receivable	—	—	(1,821)
Acquisitions, net of cash acquired	(85,755)	(44,791)	(125,248)
Proceeds from other investments	500	(170)	(250)
Proceeds from sales of property, plant and equipment	200	100	2,806
Net cash used in investing activities	(148,468)	(54,188)	(10,874)
Cash flows from financing activities			

Proceeds from term loan	197,554	—	366
Proceeds from issuance of common stock	2,826	2,040	1,888
Payment of deferred financing costs	(318)	(28)	(708)
Repayment of term loan	(1,500)	—	—
Common stock dividends paid	(28,285)	(27,932)	(27,503)
Net cash provided by (used in) financing activities	170,277	(25,920)	(25,957)
Effects of exchange rate changes on cash and cash equivalents	313	420	1,648
Net increase in cash and cash equivalents	96,086	16,536	4,364
Cash and cash equivalents, beginning of period	101,622	85,086	80,722
Cash and cash equivalents, end of period	$ 197,708	$ 101,622	$ 85,086
Supplemental disclosures:			
Cash paid for interest	$ 6,537	$ 200	$ 114
Cash paid for income taxes, net	21,051	8,142	4,930
Supplemental disclosure of non-cash investing and financing activities:			
Deferred financing costs included in accounts payable	—	423	—
Fair value of non-cash consideration for the acquisition of Cool Lab, LLC	—	10,348	—

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

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BROOKS AUTOMATION, INC.

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

	Common Stock Shares	Common Stock at Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income	Accumulated Deficit	Treasury Stock	Total Brooks Automation, Inc. Stockholders' Equity	Noncontrolli Interests in Subsidiaries
	(In thousands, except share data)							
0, 2015	81,093,052	$ 811	$ 1,846,357	$ 5,898	$ (1,020,065)	$ (200,956)	$ 632,045	$ —
d under ck and ns, net	1,127,218	10	(2,391)				(2,381)	
n			11,737				11,737	
ck clared, share					(27,503)		(27,503)	
					(69,476)		(69,476)	
ency				8,844			8,844	
ains on et of tax 8				(106)			(106)	
ses e year, fects of				(322)			(322)	
ailment				852			852	
0, 2016	82,220,270	821	1,855,703	15,166	(1,117,044)	(200,956)	553,690	—
d under ck and ns, net	1,074,578	12	1,937				1,949	
n			17,278				17,278	
ck clared, share					(27,932)		(27,932)	
					62,612		62,612	
ency				(221)			(221)	

sses on								
t of tax								
				2			2	
ns								
e year,								
fects of								
				525			525	
ement				(259)			(259)	
0, 2017	83,294,848	833	1,874,918	15,213	(1,082,364)	(200,956)	607,644	—
d under								
ck and								
ns, net	869,282	8	2,818				2,826	
n			19,822				19,822	
ck								
clared,								
share					(28,285)		(28,285)	
of								
ng								
			876				876	111
					116,575		116,575	(111)
ency								
				(1,651)			(1,651)	
sses on								
t of tax								
				(111)			(111)	
ns								
e year,								
fects of								
				136			136	
0, 2018	84,164,130	$ 841	$ 1,898,434	$ 13,587	$ (994,074)	$ (200,956)	$ 717,832	$ —

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

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BROOKS AUTOMATION, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Nature of the Business

Brooks Automation, Inc. ("Brooks", or the "Company") is a leading global provider of automation and cryogenic solutions for multiple markets. The Company primarily serves two distinct and unrelated markets: the semiconductor capital equipment market and the life sciences sample management market. The Company believes its leadership positions and its global support capability in each of these markets makes it a valued business partner to the largest semiconductor capital equipment and device makers, and pharmaceutical and life science research institutions in the world. The Company's offerings are also applied to other adjacent technology and industrial markets, and the Company provides customer support services globally.

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 (please refer to Note 3, "Discontinued Operations" for further information about the discontinued business). 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.

2. Summary of Significant Accounting Policies

Principles of Consolidation and Basis of Presentation

The accompanying Consolidated Financial Statements include the accounts of the Company and its majority-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation. The Company applies equity method of accounting to investments that provide it with ability to exercise significant influence over the entities in which it lacks controlling financial interest and is not a primary beneficiary.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported amounts of revenue and expenses during the reporting period. Significant estimates are associated with recording accounts receivable, inventories, goodwill, intangible assets other than goodwill, long-lived assets, derivative financial instruments, deferred income taxes, warranty and pension obligations, revenue recognized in accordance with the percentage of completion method, and stock-based compensation expense. The Company assesses the estimates on an ongoing basis and records changes in estimates in the period they occur and become known. Actual results could differ from these estimates.

Business Combinations

The Company accounts for business acquisitions using the acquisition method of accounting, in accordance with which assets acquired and liabilities assumed are recorded at their respective fair values at the acquisition date. The fair value of the consideration paid, including contingent consideration, is assigned to the assets acquired and liabilities assumed based on their respective fair values. Goodwill represents excess of the purchase price over the estimated fair values of the assets acquired and liabilities assumed.

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Significant judgments are used in determining fair values of assets acquired and liabilities assumed, as well as intangibles. Fair value and useful life determinations are based on, among other factors, estimates of future expected cash flows, royalty cost savings and appropriate discount rates used in computing present values. These judgments may materially impact the estimates used in allocating acquisition date fair values to assets acquired and liabilities assumed, as well as the Company's current and future operating results. Actual results may vary from these estimates which may result in adjustments to goodwill and acquisition date fair values of assets and liabilities during a measurement period or upon a final determination of asset and liability fair values, whichever occurs first. Adjustments to fair values of assets and liabilities made after the end of the measurement period are recorded within the Company's operating results.

Foreign Currency Translation

Certain transactions of the Company and its subsidiaries are denominated in currencies other than their functional currency. Foreign currency exchange gains (losses) generated from the settlement and remeasurement of these transactions are recognized in earnings and presented within "Other (expense) income, net" in the Company's Consolidated Statements of Operations. Net foreign currency transaction and remeasurement losses totaled $3.3 million, $2.3 million and $1.9 million for the fiscal years ended September 30, 2018, 2017 and 2016, respectively.

The determination of the functional currency of the Company's subsidiaries is based on their financial and operational environment and is the local currency of all of the Company's foreign subsidiaries. The subsidiaries' assets and liabilities are translated into the reporting currency at period-end exchange rates, while revenue, expenses, gains and losses are translated at the average exchange rates during the period. Gains and losses from foreign currency translations are recorded in accumulated other comprehensive income in the Company's Consolidated Balance Sheets and presented as a component of comprehensive income (loss) in the Company's Consolidated Statements of Comprehensive Income (Loss).

Derivative Financial Instruments

All derivatives, whether designated as a hedging relationship or not, are recorded in the Consolidated Balance Sheets at fair value. The accounting for changes in fair value of a derivative instrument depends on whether it has been designated and qualifies as part of a hedging relationship and the type of hedging relationship. For those derivative instruments that are designated and qualify as hedging instruments, the Company must designate the hedging instrument as a fair value hedge, cash flow hedge or a hedge of a net investment in a foreign operation based on the exposure being hedged. Certain derivatives held by the Company are not designated as hedges but are used in managing exposure to changes in foreign exchange rates.

A fair value hedge is a derivative instrument designated for the purpose of hedging the exposure of changes in fair value of an asset or a liability resulting from a particular risk. If the derivative is designated as a fair value hedge, the changes in the fair value of the derivative and of the hedged item attributable to the hedged risk are both recognized in the results of operations and presented in the same caption in the Consolidated Statements of Operations and Consolidated Statements of Comprehensive Income (Loss).

A cash flow hedge is a derivative instrument designated for the purpose of hedging the exposure to variability in future cash flows resulting from a particular risk. If the derivative is designated as a cash flow hedge, the effective portions of changes in the fair value of the derivative are recorded in accumulated other comprehensive income and recognized in the results of operations when the hedged item affects earnings. Ineffective portions of changes in the fair value of cash flow hedges are recognized in the results of operations.

A hedge of a net investment in a foreign operation is achieved through a derivative instrument designated for the purpose of hedging the exposure of changes in value of investments in foreign subsidiaries. If the derivative is designated as a hedge of a net investment in a foreign operation, the effective portions of changes in the fair value of the derivative are recorded in other comprehensive income as a part of the foreign currency translation adjustment. Ineffective portions of net investment hedges are recognized in the results of operations.

For derivative instruments not designated as hedging instruments, changes in fair value are recognized in the Consolidated Statements of Operations as gains or losses consistent with the classification of the underlying risk.

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Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist of cash deposits and cash equivalents, marketable securities, derivative instruments and accounts receivable. All of the Company’s cash, cash equivalents, marketable securities and derivative instruments are maintained by major financial institutions.

The Company invests cash not used in operations in investment grade, high credit quality securities in accordance with the Company’s investment policy which provides guidelines and limits regarding investments type, concentration, credit quality and maturity terms aimed at maintaining liquidity and reducing risk of capital loss.

The Company regularly monitors the creditworthiness of its customers and believes that it has adequately provided for exposure to potential credit losses. The Company’s ten largest customers accounted for approximately 34%, 35% and 35% of its consolidated revenue for the fiscal years ended September 30, 2018, 2017 and 2016, respectively. No customers accounted for more than 10% of the Company’s consolidated revenue for fiscal years 2018, 2017 and 2016.

Fair Value of Financial Instruments

The Company’s financial instruments consist of cash and cash equivalents, marketable securities, derivative instruments, term loan, accounts receivable, and accounts payable. Marketable securities, derivative instruments and term loan are measured at fair value based on quoted market prices or observable inputs other than quoted market prices for identical or similar assets or liabilities. The carrying amounts of cash, cash equivalent, accounts receivable and accounts payable approximate their fair value due to their short-term nature.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and highly liquid investments with original maturities of three months or less that are readily convertible to known amounts of cash. At September 30, 2018 and 2017, cash equivalents were $50.6 million and less than $0.1 million, respectively. Cash equivalents are reported at cost which approximates their fair value due to their short-term nature and varying interest rates.

Accounts Receivable, Allowance for Doubtful Accounts and Sales Returns

Trade 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 based on a number of factors, including an evaluation of customer credit worthiness, the age of the outstanding receivables, economic trends and historical experience. The Company reviews its allowance for doubtful accounts on a quarterly basis and adjusts the balance based on the Company’s estimates of the receivables’ recoverability in the period the changes in estimates occur and become known. Accounts receivable balances are written off against the allowance for doubtful accounts when the Company determines that the balances are not recoverable. Provisions for doubtful accounts are recorded in "Selling, general and administrative expenses" in the Consolidated Statements of Operations. The Company determines the allowance for sales returns based on its best estimate of probable customer returns. Provisions for sales returns are recorded in "Revenue" in the Consolidated Statements of Operations. The Company does not have any off-balance-sheet credit exposure related to its customers.

Inventories

Inventories are stated at the lower of cost or market determined on a first-in, first-out basis and include the cost of materials, labor and manufacturing overhead. The Company reports inventories at their net realizable value and provides reserves for excess, obsolete or damaged inventory based on changes in customer demand, technology and other economic factors.

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Fixed Assets, Intangible Assets and Impairment of Long-lived Assets

Property, plant and equipment are stated at cost, net of accumulated depreciation. Depreciation expense is computed based on the straight-line method and charged to results of operations to allocate the cost of the assets over their estimated useful lives, as follows:

Buildings	10 - 40 years
Computer equipment and software	3 - 7 years
Machinery and equipment	2 - 10 years
Furniture and fixtures	3 - 10 years

Leasehold improvements are amortized over the shorter of their estimated useful lives or the remaining terms of the respective leases. Equipment used for demonstrations to customers is included in machinery and equipment and depreciated over its estimated useful life. Repair and maintenance costs are expensed as incurred.

The Company has developed software for internal use. Internal and external labor costs incurred during the application development stage of a project are capitalized. Costs incurred prior to application development and post implementation are expensed as incurred. Training and data conversion costs are expensed as incurred. As of September 30, 2018, and 2017, the Company had cumulative capitalized direct costs of $5.6 million and $4.7 million, respectively, associated with development of software for its internal use. These capitalized costs are included within "Property, plant and equipment, net" in the accompanying Consolidated Balance Sheets. During fiscal year 2018, the Company capitalized direct costs of $0.9 million associated with development of software for its internal use.

Cost of disposed assets and the associated accumulated depreciation are derecognized upon their retirement or at the time of disposal, and the resulting gain or loss is included in the Company’s results of operations.

The Company identified finite-lived intangible assets other than goodwill as a result of acquisitions. Finite-lived intangible assets are valued based on estimated future cash flows and amortized over their estimated useful lives based on methods that approximate the pattern in which the economic benefits are expected to be realized.

Finite-lived intangibles assets and fixed assets are tested for impairment when indicators of impairment are present. For purposes of this test, long-lived assets are grouped with other assets and liabilities at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. If the Company determines that indicators of potential impairment are present, it assesses the recoverability of long-lived asset group by comparing its undiscounted future cash flows to its carrying value. The future cash flow period is based on the future service life of the primary asset within the long-lived asset group. If the carrying value of the long-lived asset group exceeds its future cash flows, the Company determines fair values of the individual net assets within the long-lived asset group to assess potential impairment. If the aggregate fair values of the individual net assets of the group are less than their carrying values, an impairment loss is recognized for an amount in excess of the group’s aggregate carrying value over its fair value. The loss is allocated to the assets within the group based on their relative carrying values, with no asset reduced below its fair value.

Finite-lived intangible assets are amortized over their useful lives, as follows:

Patents	7 - 15 years
Completed technology	3 - 10 years

Customer relationships	3 - 11 years

Goodwill

Goodwill represents the excess of a purchase price over the fair value of net tangible and identifiable intangible assets of the businesses acquired by the Company. Goodwill is tested for impairment annually or more often if impairment indicators are present at the reporting unit level. The Company has elected April 1st as its annual goodwill impairment assessment date. If the existence of events or circumstances indicates that it is more likely than not that fair

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values of the reporting units are below their carrying values, the Company performs additional impairment tests during interim periods to evaluate goodwill for impairment.

Application of the goodwill impairment test requires significant judgment based on market and operational conditions at the time of the evaluation, including management's best estimate of future business activity and the related estimates of future cash flows from the assets and the reporting units that include the associated goodwill. These periodic evaluations could cause management to conclude that impairment factors exist, requiring an adjustment of these assets to their then-current fair market values. Future business conditions and/or activity could differ materially from the projections made by management which could result in additional adjustments and impairment charges.

The goodwill impairment test is performed at the reporting unit level. A reporting unit is either an operating segment or one level below it, which is referred to as a "component". The level at which the impairment test is performed requires an assessment of whether the operations below an operating segment constitute a self-sustaining business, in which case testing is generally performed at this level.

In accordance with ASC 350, Intangibles- Goodwill and Other ("ASC 350"), the Company first assesses qualitative factors to determine whether the existence of events or circumstances indicates that it is more likely than not that the fair value of a reporting unit is less than its carrying value. If the Company determines, based on this assessment, that it is more likely than not that the fair value of the reporting unit is less than its carrying value, it performs a quantitative goodwill impairment test by comparing the reporting unit's fair value with its carrying value. An impairment loss is recognized for the amount by which the reporting unit's carrying value exceeds its fair value, up to the total amount of goodwill allocated to the reporting unit.

The Company determines fair values of its reporting units based on an income approach in accordance with the discounted cash flow method, or DCF Method. The DCF Method is based on projected future cash flows and terminal value estimates discounted to their present values. Terminal value represents a present value an investor would pay on the valuation date for the rights to the cash flows of the business for the years subsequent to the discrete cash flow projection period. The observable inputs used in the DCF Method include discount rates set above the Company's weighted-average cost of capital. The Company derives discount rates that are commensurate with the risks and uncertainties inherent in the respective businesses and its internally developed projections of future cash flows. The Company considers the DCF Method to be the most appropriate valuation technique since it is based on management's long-term financial projections. Due to the cyclical nature of the semiconductor equipment market, management's projections as of the valuation date are considered more objective since market metrics of peer companies fluctuate during the cycle. In addition, the Company also compares aggregate values of its net corporate assets and reporting unit fair values to its overall market capitalization and uses certain market-based valuation techniques to test the reasonableness of the reporting unit fair values determined in accordance with the DCF Method.

Deferred Financing Costs

The Company records commitment fees and other costs directly associated with obtaining the term loan and line of credit financing as deferred financing costs which are presented within "Other assets" in the accompanying Consolidated Balance Sheets. Deferred financing costs were $2.9 million and $0.5 million at both September 30, 2018 and 2017. Such costs are amortized over the term of the related financing arrangement and included in "Interest expense" in the accompanying Consolidated Statements of Operations. Amortization expense incurred during fiscal years ended September 30, 2018 and 2017 was not material and was included in interest expense in the accompanying Consolidated Statements of Operations. Please refer to Note 10, "Line of Credit" and Note 11, "Debt" for further information on this arrangement.

Warranty Obligations

The Company offers warranties on the sales of certain of its products and records warranty obligations for estimated future claims at the time revenue is recognized. Warranty obligations are estimated based on historical experience and management's estimate of the level of future claims.

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Defined Benefit Pension Plans

The cost and obligations of the Company's defined benefit pension plans are calculated based on certain assumptions related to the estimated benefits that employees earn while working, the amount of which cannot be completely determined until the benefit payments cease. Key assumptions used in accounting for these employee benefit plans include the discount rate, expected return on plan assets and rate of increase in employee compensation levels. Assumptions are determined based on Company data and appropriate market indicators in consultation with third-party actuaries, and are evaluated each year as of the plans' measurement date.

Revenue Recognition

The Company generates revenue from the following sources:

- 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 and other support services.

The Company recognizes revenue for such products and services when it is realized or realizable and earned. Revenue is considered realized and earned when all of the following revenue recognition criteria have been met: (i) persuasive evidence of an arrangement exists; (ii) delivery has occurred or services have been rendered; (iii) the fee is fixed or determinable; and (iv) collectability is probable. The Company recognizes shipping and handling fees billed to customers as revenue and includes the related costs in "Cost of revenue" in the accompanying Consolidated Statements of Operations. Revenue is presented net of taxes assessed by governmental authorities on revenue-producing transactions. Revenue from software products generated during fiscal years ended September 30, 2018 and 2017 was insignificant.

Products

Revenue from the sale of products is recognized upon their delivery to customers, provided all other revenue recognition criteria have been met. Delivery is considered complete when both of the following conditions have been met: (i) legal title and risk of loss have transferred to the customer upon product shipment or delivery; and (ii) the Company has reliably demonstrated that products have met their required specifications prior to shipment and, as a result, the Company possesses an enforceable claim right to amounts recognized as revenue. Revenue is recognized upon obtaining a customer technical acceptance if the Company was not able to demonstrate that products have met their required specifications prior to shipment and / or legal title and risk of loss did not transfer to the customer upon product shipment or delivery. 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.

Customer allowances and rebates consist primarily of volume discounts and other incentive programs. Customer allowance and rebate amounts are estimated based on historical experience, contractual terms and expected level of sales during the qualifying incentive program period. The Company records customer allowances and rebates as a reduction of revenue at the time of product sale since they represent a reduction in purchase price.

Revenue from product sales that involve significant customization, which include primarily automated cold sample management systems, is recognized based on the percentage of completion method. 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 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. These estimates are based on a number of factors, including the degree of required product customization and the customer's existing environment based on installation work, 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

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probable and can be reasonably estimated. The Company reviews profit estimates for long-term contracts during each reporting period and revises them based on changes in circumstances.

The Company uses the completed contract method for certain arrangements that involve significant product customization and include contractual terms and customer rights disallowing the use of the percentage of completion method. The Company recognizes revenue for these arrangements upon completion or substantial completion of the project, provided all other revenue recognition criteria have been met. The project is considered substantially complete when the Company receives acceptance 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 as deferred revenue.

Services

Service revenue is generally recognized ratably over the period of performance, provided all other revenue recognition criteria have been met. Payments due or received from the customers prior to rendering the associated services are recorded as deferred revenue. Revenue from 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. If the repairs or the upgrades include installation, revenue is generally recognized when the installation is completed unless the installation period is longer term in nature and the project is accounted for on percentage-of-completion basis.

Multiple Element Arrangements

Certain customer arrangements related to the sale of automated cold sample management systems and contamination control solution products represent multiple element arrangements that include product, service and other elements. The Company allocates arrangement consideration to each deliverable that has a standalone value based upon the selling price hierarchy which requires the Company to use vendor-specific objective evidence (the "VSOE") of selling price if it exists, or a third-party evidence (the "TPE") of the selling price in the absence of VSOE. If neither VSOE nor TPE of selling price exists for a deliverable, the Company uses its best estimate of selling price (the "BESP") for that deliverable. The Company has not been able to establish VSOE or TPE for the deliverables included in the multiple element arrangements and, as a result, primarily uses BESP to allocate the arrangement consideration. The Company determines BESP based on the cost plus a reasonable margin approach and considers entity-specific, as well as external market factors, when developing such estimates.

The Company recognizes revenue for each deliverable that has a standalone value in accordance with its revenue recognition policies. Revenue allocated to the delivered elements is recognized at the time of delivery, provided all other revenue recognition criteria are met. Revenue allocated to the undelivered elements is deferred until the elements are delivered and all other revenue recognition criteria have been met.

Certain multiple element arrangements include the sale of automated cold sample management systems and contamination control solution products with installation services. Revenue allocated to the automated cold sample management systems and contamination control solution products is recognized in accordance with the Company's revenue recognition policies. Revenue allocated to the installation services is recognized based on the percentage-of-completion method or the completed contract method in which case it is deferred until the installation-related tasks have been completed.

Certain customer arrangements include contingent revenue provisions in which a portion of the selling price of a delivered element is contingent on meeting specified performance criteria or on delivery of other elements included in the arrangement. The amount of revenue recognized for these arrangements is limited to the lower of either: (i) the amount billed to the customer that is not contingent on obtaining a customer technical acceptance; or (ii) the value of the arrangement consideration allocated to the delivered elements.

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Research and Development Expense

Research and development costs are expensed as incurred. Research and development costs consist primarily of personnel expenses related to development of new products, as well as enhancements and engineering changes to existing products and development of hardware and software components.

Stock-Based Compensation Expense

The Company measures stock-based compensation cost at fair value on the grant date and recognizes the expense over the service period for the awards expected to vest. 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 Nasdaq 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. The Company recognizes benefits from stock-based compensation in equity using the with-and-without approach for the utilization of tax attributes. The Company makes estimates of stock award forfeitures and a number of awards expected to vest which requires significant judgment. The Company considers many factors in developing forfeiture estimates, including award types, employee classes and historical experience. The Company assesses the likelihood of achieving the performance goals for stock-based awards that vest upon the satisfaction of these goals. Current estimates may differ from actual results and future changes in estimates.

The following table reflects stock-based compensation expense, excluding amounts related to discontinued operations, recorded during the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	Year Ended September 30,		
	2018	2017	2016
Restricted stock	$ 18,081	$ 16,056	$ 10,859
Employee stock purchase plan	775	517	418
Total stock-based compensation expense	$ 18,856	$ 16,573	$ 11,277

Valuation Assumptions for an Employee Stock Purchase Plan

The fair value of shares issued under the employee stock purchase plan is estimated on the commencement date of each offering period using the Black-Scholes option-pricing model with the following weighted average assumptions for the fiscal years ended September 30, 2018, 2017 and 2016:

	Year Ended September 30,		
	2018	2017	2016
Risk-free interest rate	1.9 %	0.9 %	0.4 %
Volatility	46 %	34 %	32 %
Expected life	6 months	6 months	6 months
Dividend yield	1.5 %	3.4 %	3.4 %

The risk-free rate is based on the U.S. Treasury yield curve for notes with terms approximating the expected life of the shares granted. The expected stock price volatility is determined based on the Company's historic stock prices over a period commensurate with the expected life of the shares granted. The expected life represents the weighted average period over which the shares are expected to be purchased. Dividend yields are projected based on the Company's history of dividend declarations and management's intention for future dividend declarations.

Restructuring Expenses

The Company records restructuring expenses associated with management-approved restructuring actions, such as consolidation of duplicate infrastructure and reduction in force, to streamline its business operations and improve profitability and competitiveness. Restructuring expenses include severance costs, contract termination costs to vacate facilities and consolidate operations, and other costs directly associated with restructuring actions. The Company records severance and other employee termination costs associated with restructuring actions when it is probable that benefits

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will be paid and the amounts can be reasonably estimated. The rates used in determining restructuring liabilities related to severance costs are based on existing plans, historical experience and negotiated settlements.

Income Taxes

The Company records income taxes using the asset and liability method. Deferred income tax assets and liabilities are recognized for the future tax differences between the financial statement carrying amounts of existing assets and liabilities and their respective income tax bases, as well as operating loss and tax credit carryforwards. The Company's Consolidated Financial Statements contain certain deferred tax assets that were recorded as a result of operating losses, as well as other temporary differences between financial and tax accounting. A valuation allowance is established against deferred tax assets if, based upon the evaluation of positive and negative evidence and the extent to which that evidence is objectively verifiable, it is more likely than not that some or all of the deferred tax assets will not be realized.

Significant management judgment is required in determining the Company's income tax provision, the Company's deferred tax assets and liabilities and any valuation allowance recorded against those net deferred tax assets. The Company evaluates the weight of all available evidence to determine whether it is more likely than not that some portion or all of the net deferred income tax assets will not be realized.

The calculation of the Company's tax liabilities involves consideration of uncertainties in the application of complex tax regulations. The Company recognizes liabilities for uncertain tax positions based on a two-step process. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained upon an audit or an examination conducted by taxing authorities, including resolution of related appeals or litigation processes, if any. If the Company determines that a tax position will more likely than not be sustained, the second step requires the Company to estimate and measure the tax benefit as the largest amount that is more likely than not to be realized upon ultimate settlement. It is inherently difficult and subjective to estimate such amounts, as the Company has to determine the probability of various possible outcomes. The Company re-evaluates these uncertain tax positions on a quarterly basis. This evaluation is based on factors, such as changes in facts or circumstances, tax law, new audit activity and effectively settled issues. Determining whether an uncertain tax position is effectively settled requires judgment. A change in recognition or measurement may result in the recognition of a tax benefit or an additional charge to the tax provision.

Earnings Per Share

Basic income (loss) per share is determined by dividing net income (loss) by the weighted average common shares outstanding during the period. Diluted income (loss) per share is determined by dividing net income (loss) by diluted weighted average shares outstanding during the period. Diluted weighted average shares reflect the dilutive effect, if any, of potential common shares. To the extent their effect is dilutive, employee equity awards and other commitments to be settled in common stock are included in the calculation of diluted income per share based on the treasury stock method. Potential common shares are excluded from the calculation of dilutive weighted average shares outstanding if their effect would be anti-dilutive at the balance sheet date based on a treasury stock method or due to a net loss.

Recently Issued 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 will adopt this standard effective October 1, 2018, using the modified retrospective method and will only apply this method to contracts that are not completed as of the effective date and all new contracts initiated on or after the effective date. The Company's quarterly results beginning with the quarter ended December 31, 2018 will be compliant with ASC 606. The Company's Annual Report on Form 10-K for the year ended September 30, 2019 will be the

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Company's first Annual Report that will be issued in compliance with ASC 606. Comparative prior periods will not be restated.

The Company has established an implementation team to assist with its assessment of the impact of the new revenue guidance on its operations, consolidated financial statements and related disclosures. The implementation team is also responsible for evaluating and designing the necessary changes to the Company's business processes, policies, systems and controls to support recognition and disclosure under the new guidance. The implementation team has completed its procedures over the implementation of ASC 606 and has identified the necessary changes to the Company's processes, policies, systems and controls.

The Company expects to record a cumulative-effect adjustment as of October 1, 2018, which is expected to impact retained earnings by an amount not to exceed $3 million. This adjustment is driven by the acceleration of revenue within the Semiconductor Solutions Group segment, and deferral of previously recognized revenue and commission expense within the Brooks Life Sciences segment. The anticipated adjustment within the Semiconductor Solutions Group segment is derived from the elimination of billing constraints that historically prevented the Company from recognizing revenue in excess of its right to bill. The anticipated adjustment within the Brooks Life Science segment is derived from the requirement to recognize revenue and commission expense associated with certain transactions over time under ASC 606, while historically these transactions have been recorded at a point in time. In accordance with the adoption of ASC 606, classification of certain balance sheet accounts will be impacted through the creation of contract assets and contract liabilities, and additional disclosures will be required. The Company's systems and internal control environment are not expected to be significantly impacted by the adoption of the standard. The Company will fully disclose the impacts of the new standard in connection with its Quarterly Report on Form 10-Q for the quarter ended December 31, 2018.

In accordance with the adoption of ASC 606, the Company expects to accelerate revenue related to semiconductor contamination control solutions as the Company is no longer required to restrain revenue in accordance with billing constraints defined in the contract with the customer. Under ASC 606, this constraint has been removed, permitting the Company to recognize revenue in an amount equivalent to the transfer of control that has occurred. This change will result in an anticipated impact to retained earnings of approximately $1 million to $2 million as of October 1, 2018. In addition, the Company expects to defer previously recognized revenue related to sample life cycle management solutions. Fees associated with the registration of biological samples are currently recognized at a point in time upon completion of the registration services, provided all other criteria for revenue recognition have been met. The adoption of the standard will result in revenue generated from registration fees being recognized ratably over the period of benefit, which is generally two years. This change will result in an anticipated impact to retained earnings of approximately $2 million to $4 million as of October 1, 2018. The Company expects this impact to retained earnings to be offset by the deferral of previously recognized commission expense. Sales commissions resulting from the acquisition of contracts with customers are currently expensed when incurred. Upon the adoption of the standard certain costs to obtain a contract will be required 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. The Company expects this change to impact its commissions earned on contracts with a term greater than 12 months. This change will result in an anticipated impact to retained earnings of approximately $0.8 million to $1.4 million as of October 1, 2018 for contracts which are not completed as of the effective date. The adoption of ASC 606 will result in additional changes to the Company's retained earnings. The effect of these changes both individually and in the aggregate are expected to be insignificant and result from identification of additional performance obligations, reallocation of transaction consideration and changes to the timing and amount of revenue recognized for certain product and service offerings. The corresponding tax effect from these adjustment's will have an insignificant impact to the cumulative effect adjustment.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which replaces ASC 840 to set forth disclosure requirements related to leases. In accordance with 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 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

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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 606. 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.

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 January 2017, the FASB issued ASU 2017-01, Business Combinations (Topic 805): Clarifying the Definition of a Business, which amends ASC 805 to add, remove, and clarify disclosure requirements related to business combinations. This guidance revised the definition of a business to assist entities with evaluating whether a set of transferred assets and activities represents a business. Such a set of transferred assets and activities does not represent a business if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets. If the threshold is not met, entities need to evaluate whether the set of assets and activities meets the requirement that a business includes, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. The guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2017 and should be adopted prospectively. Early adoption of the newly issued guidance is permitted. The Company is currently evaluating the impact of this guidance on its financial position and results of operations.

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 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 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

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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 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.

Recently Adopted Accounting Pronouncements

In March 2016, the FASB issued ASU 2016-09, Compensation-Stock Compensation (Topic 718): Improvement to Employee Share-Based Payment Accounting, which amends ASC 718 to add, remove, and clarify disclosure requirements related to stock compensation. This guidance was issued to simplify accounting for share-based payment awards issued to employees. The amendment requires recognition of excess tax benefits or deficiencies within income tax expense or benefit and changes their presentation requirements on the statement of cash flows. Additionally, the entity can make an accounting policy election to either estimate the number of awards that are expected to vest, consistent with the current accounting guidance, or account for forfeitures as they occur. The guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2016. Early adoption of the newly issued guidance is permitted. The Company adopted the guidance during the first quarter of fiscal year 2018. Upon adoption of this guidance, the Company made an accounting policy election to continue accounting for forfeitures by applying an estimated forfeiture rate. The adoption of this guidance did not have an impact on the stock compensation expense amount recognized during the year ended September 30, 2018 and accumulated deficit at September 30, 2018.

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 first quarter of calendar year 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 entered 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 from 1 month to 6 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.

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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.

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

	Fiscal Year Ended September 30,		
	2018	2017	2016
Revenue			
Products	$ 150,365	$ 126,638	$ 85,860
Services	45,731	38,748	40,451
Total revenue	196,096	165,386	126,311
Cost of revenue			
Products	85,350	73,714	55,144
Services	22,834	22,400	28,974
Total cost of revenue	108,184	96,114	84,118
Gross profit	87,912	69,272	42,193
Operating expenses			
Research and development	7,605	6,860	6,932
Selling, general and administrative	25,017	12,536	12,139
Restructuring charges	2	82	1,830
Total operating expenses	32,624	19,478	20,901
Operating income	55,288	49,794	21,292
Interest income			
Interest expense			
Other (expense) income, net	1,091	1,057	804
Income before income taxes and earnings of equity method investment	56,379	50,851	22,096
Income tax provision	14,420	8,760	9,560
Income before equity in earnings of equity method investment	41,959	42,091	12,536
Equity in earnings of equity method investment	6,788	9,834	3,445
Net income	$ 48,747	$ 51,925	$ 15,981

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):

	September 30,	
	2018	2017
Balance Sheets:		
Current assets	$ 69,302	$ 74,645
Non-current assets	21,338	16,829

Current liabilities	26,006	29,622
Non-current liabilities	8,397	7,860

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	Fiscal Year Ended September 30,		
	2018	2017	2016
Statements of Operations:			
Total revenue	$ 94,652	$ 104,667	$ 68,054
Gross profit	34,982	41,241	23,586
Operating Income	18,405	26,340	10,571
Net income	13,345	19,451	7,492

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):

	Fiscal Year Ended September 30,		
	2018	2017	2016
Depreciation and amortization	$ 743	$ 919	$ 1,034
Capital expenditures	302	1,049	560
Stock-based compensation	966	705	460
Earnings of equity method investment	(6,788)	(9,834)	(3,445)

The carrying value of the assets and liabilities of the discontinued operations on the Consolidated Balance Sheet as of September 30, 2018 and September 30, 2017 were as follows (in thousands):

	Fiscal Year Ended September 30,	
	2018	2017
Assets		
Accounts receivable, net	$ 27,852	$ 27,363
Inventories	37,953	32,998
Other current assets	343	310
Total current assets of discontinued operation	$ 66,148	$ 60,671
Property, plant and equipment, net	$ 1,081	$ 1,481
Goodwill	26,485	26,485
Intangibles, net	14	16
Equity method investment	31,472	28,570
Other assets	-	1
Total long-term assets of discontinued operation	$ 59,052	$ 56,553

Liabilities

Deferred revenue	$ 1,052	$ 1,728
Accrued warranty and retrofit costs	2,464	2,574
Accrued compensation and benefits	3,648	3,189
Other current liabilities	224	334
Total current liabilities of discontinued operation	$ 7,388	$ 7,825
Long-term liabilities of discontinued operation	$ 698	$ 652

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4. Acquisitions

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. In 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.

The preliminary amounts recorded were 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 intangible 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. The revenues and net loss from Tec-Sem included in the Company's consolidated results for fiscal year 2018 were $11.6 million and $1.2 million, respectively. During fiscal year 2018, the net loss included $0.7 million related to the step-up in value of the acquired inventories and $2.1 million related to amortization expense of acquired intangible assets. During fiscal year 2018, the Company incurred $0.9 million in transaction costs related to the Tec-Sem acquisition.

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. Upon successful delivery of such technology, the Company expects to collect a portion of the $0.8 million which represent reimbursement of costs incurred to complete development.

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The Company did not present a pro forma information summary for its consolidated results of operations for the fiscal years ended September 30, 2018 and 2017 as if the acquisition of Tec-Sem occurred on October 1, 2016 because such results were immaterial.

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 has expanded 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 intangible 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 acquisition date, a cash payment of $0.4 million was placed into escrow which was ascribed to the purchase price. The escrow was related to satisfaction of the sellers' indemnification obligations with respect to their representations and warranties and other indemnities. The escrow balance was $0.2 million as of September 30, 2018.

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. During fiscal year 2018, revenue and net loss from 4titude recognized in the Company's results of operations were \$15.9 million and \$0.8 million, respectively. The net in fiscal year 2018 included recurring charges of \$4.1 million, related to amortization expense of acquired intangible assets. The net loss in fiscal year 2018 also included non-recurring charges of \$1.2 million related to the step-up in value of the acquired inventories. During fiscal year 2018, the Company incurred \$1.1 million in non-recurring transaction costs with respect to the 4titude acquisition.

The Company did not present a pro forma information summary for its consolidated results of operations for the fiscal years ended September 30, 2018 and 2017 as if the acquisition of 4titude occurred on October 1, 2016 because such results were immaterial.

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Other

On April 20, 2018, the Company acquired BioSpeciMan Corporation (“BioSpeciMan”), a Canada-based 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, 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 placed into escrow which was ascribed to the purchase price. The escrow was related to satisfaction of the sellers' indemnification obligations with respect to their representations and warranties and other indemnities.

The operating results of the acquisition have been reflected in the results of operations for the Brooks Life Sciences segment. The Company did not present a pro forma information summary for its consolidated results of operations for the fiscal years ended September 30, 2018 and 2017 as if the acquisition of BioSpeciMan occurred on October 1, 2016 because such results were immaterial.

Acquisitions Completed in Fiscal Year 2017

Acquisition of Pacific Bio-Material Management, Inc. and Novare, LLC

On July 5, 2017, the Company entered into an asset purchase agreement with Pacific Bio-Material Management, Inc. (“PBMMI”) and Novare, LLC, a wholly owned subsidiary of PBMMI (collectively, the “sellers”), to acquire substantially all the assets and liabilities of the sellers’ business related to providing storage, transportation, management, and cold chain logistics of biological materials. The acquisition has expanded the Company’s existing capabilities with respect to sample management and integrated cold chain storage and transportation solutions within the Brooks Life Sciences segment. The Company paid to the sellers cash consideration of $34.3 million, net of cash acquired and subject to working capital adjustments.

The Company used a market participant approach to record the assets acquired and liabilities assumed in the PBMMI acquisition. The amounts recorded were as follows (in thousands):

	Fair Value of Assets and Liabilities
Accounts receivable (approximates contractual value)	$ 2,800
Prepaid expenses and other current assets	267
Property, plant and equipment	2,887
Intangible assets	8,600

Goodwill		21,434
Accounts payable		(699)
Accrued liabilities		(673)
Deferred revenue		(385)
Other liabilities		(103)
Total purchase price, net of cash acquired	$	34,128

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The Company applied variations of the income approach to estimate the fair values of the intangible assets acquired. The identified intangible assets include customer relationship intangible (excess-earnings method) of $8.5 million and trademarks of $0.1 million. The intangible assets acquired are amortized over the total weighted average period of 11.0 years using methods that approximate the pattern in which the economic benefits are expected to be realized.

At the acquisition date, a cash payment of $3.3 million was placed into escrow which was ascribed to the purchase price. The escrow balance of $3.3 million included $2.9 million related to satisfaction of the sellers' indemnification obligations with respect to their representations and warranties and other indemnities, as well as $0.4 million payable to the former owner of Novare as a compensation for a sale of his ownership interest. This escrow arrangement is administered by the Company on behalf of the sellers. The escrow balance related to satisfaction of the sellers' indemnification obligations was $2.7 million as of September 30, 2018. The Novare escrow balance was reduced by its full amount as of September 30, 2018.

Goodwill represents the excess of the consideration transferred 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 PBMMI with the Company’s operations and is deductible for tax purposes.

The operating results of PBMMI have been reflected in the results of operations for the Brooks Life Sciences segment. During fiscal year 2018, revenue and net income from PBMMI recognized in the Company’s results of operations were $11.5 million and $0.7 million, respectively. During fiscal year 2017, revenue and net income from PBMMI recognized in the Company’s results of operations were $3.4 million and $0.8 million, respectively. During fiscal year ended September 30, 2018 and 2017, the net income included amortization expense of $1.6 million and $0.3 million, respectively, related to acquired intangible assets. During fiscal year 2018 and 2017, the Company incurred less than $0.1 million and $0.3 million in non-recurring transaction costs with respect to the PBMMI acquisition.

The Company did not present a pro forma information summary for its consolidated results of operations for the fiscal years ended September 30, 2017 and 2016 as if the acquisition of PBMMI occurred on October 1, 2015 because such results were immaterial.

Acquisition of Cool Lab, LLC

On November 28, 2016, the Company acquired 100% of the equity of Cool Lab, LLC ("Cool Lab") from BioCision, LLC ("BioCision"). The Company held a 20% equity ownership interest in BioCision prior to the acquisition. Cool Lab was established as a subsidiary of BioCision on November 28, 2016 upon the transfer of certain assets related to cell cryopreservation solutions. Cool Lab’s offerings assist in managing the temperature stability of therapeutics, biological samples, and related biomaterials in ultra-cold and cryogenic environments. The acquisition of Cool Lab has allowed the Company to extend its comprehensive sample management solutions across the cold chain of custody, which is consistent with the other offerings it brings to its life sciences customers.

The aggregate purchase price of $15.2 million consisted of a cash payment of $4.8 million, a liability to the seller of $0.1 million and the settlement of certain preexisting relationships with Cool Lab and BioCision, disclosed as non-cash consideration of $10.3 million, which has been measured at fair value on the acquisition date.

The Company used a market participant approach to record the assets acquired and liabilities assumed in the Cool Lab acquisition. The amounts recorded were as follows (in thousands):

	Fair Value of Assets and Liabilities
Inventory	$ 1,283
Intangible assets	6,100
Goodwill	8,527
Accrued liabilities	(30)
Other liabilities	(686)
Total purchase price	$ 15,194

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The Company applied variations of the income approach to estimate the fair values of the intangible assets acquired. The identified intangible assets include customer relationship with a certain customer (excess-earnings method) of $3.6 million with a useful life of 3 years, completed technology (relief-from-royalty) of $1.2 million with a useful life of 8 years, and other customer relationship (excess-earnings method) of $1.3 million with a useful life of 10 years. The intangible assets acquired are amortized over the total weighted average period of 5.4 years using methods that approximate the pattern in which the economic benefits are expected to be realized, including percentage of revenue expected to be generated from sales to a certain customer over the contract term.

Goodwill represents the excess of the consideration transferred 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 Cool Lab with the Company’s operations and is deductible for tax purposes.

The Company recorded a liability of $0.7 million in the purchase price allocation that represented a pre-acquisition contingency incurred on the acquisition date. The obligation is related to a rebate that is due to a particular customer if the annual product sales volume metrics exceed threshold amounts under the provisions of the contract with this customer assumed by the Company. Fair value of such liability was determined based on a probability weighted discounted cash flow model. The carrying amount of the liability was $0.8 million and $0.7 million, respectively, at September 30, 2018 and 2017.

The operating results of Cool Lab have been reflected in the results of operations for the Brooks Life Sciences segment. During fiscal year 2018, revenue and net loss from Cool Lab recognized in the Company’s results of operations were $3.7 million and $0.2 million, respectively. During fiscal year 2017, revenue and net loss from Cool Lab recognized in the Company’s results of operations were $3.7 million and $0.3 million, respectively. During fiscal year ended September 30, 2018, the net loss included charges of amortization expense $1.6 million related to acquired intangible assets. During fiscal year ended September 30, 2017, the net loss included charges of $0.4 million related to the step-up in value of the acquired inventories and amortization expense $1.2 million related to acquired intangible assets. During fiscal year 2017, the Company also incurred $0.4 million in non-recurring transaction costs with respect to the Cool Lab acquisition.

The Company did not present a pro forma information summary for its consolidated results of operations for the fiscal years ended September 30, 2017 and 2016 as if the acquisition of Cool Lab occurred on October 1, 2015 because such results were immaterial.

Other

On August 22, 2017, the Company acquired certain assets and liabilities of RURO, Inc., (the “seller”), a U.S.-based provider of sample management software solutions across multiple end markets, including academic research, government, pharmaceutical, biotech, and healthcare. The acquired FreezerPro® web-based software platform together with an exclusive license to sell and distribute RURO’s BioBankPro® software has allowed the Company to complement its existing informatics offerings within the Brooks Life Sciences segment and extend its informatics solutions to address laboratories, biobanks or enterprises that manage biological samples.

The aggregate purchase price of $5.5 million consisted of a cash payment of $5.2 million and a liability to the seller of $0.4 million. The Company allocated the purchase price of $5.5 million to the assets acquired and liabilities assumed related to the acquisition at their fair values as of the acquisition date, of which $0.1 million was ascribed to accounts receivable, $4.0 million to intangible assets, $1.6 million to goodwill assigned to the Brooks Life Sciences segment and $0.2 million to deferred revenue. Fair values of intangible assets acquired of $4.0 million consisted of customer relationship intangible assets of $3.1 million and completed technology of $0.9 million.

At the closing of the acquisition, a cash payment of $0.5 million was placed into escrow which was ascribed to the purchase price. The escrow was related to satisfaction of the sellers' indemnification obligations with respect to their representations and warranties and other indemnities.

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The operating results of the acquisition have been reflected in the results of operations for the Brooks Life Sciences segment. The Company did not present a pro forma information summary for its consolidated results of operations for fiscal years ended September 30, 2018 and 2017 as if the acquisition occurred on October 1, 2015.

Acquisitions Completed in Fiscal Year 2016

Acquisition of BioStorage Technologies, Inc.

On November 30, 2015, the Company completed its acquisition of BioStorage Technologies, Inc., or BioStorage, an Indiana-based global provider of comprehensive sample management and integrated cold chain solutions for the biosciences industry. These solutions include collection, transportation, processing, storage, protection, retrieval and disposal of biological samples. These solutions combined with the Company's existing offerings, particularly automation for sample storage and formatting, provide customers with fully integrated sample management cold chain solutions which will help them increase productivity, efficiencies and speed to market. This acquisition has allowed the Company to access a broader customer base that is storing samples at ultra-cold temperatures and simultaneously provide opportunities for BioStorage to use the Company's capabilities to expand into new markets.

The Company acquired 100% of the issued and outstanding shares of BioStorage. A cash payment of $130.7 million, net of the seller's cash of $2.8 million, resulted in a net cash outflow of $128.0 million, including $125.2 million ascribed to the purchase price and $2.5 million for retention arrangements with certain employees based on the completion of a service retention period. The cash payment included a debt repayment of $3.2 million and transaction costs of $2.9 million paid by the Company on behalf of BioStorage.

On September 9, 2016, the Company reached a settlement with the sellers of BioStorage's stock related to certain working capital adjustments. On September 13, 2016, the Company received $0.2 million of proceeds from the sellers as a result of such settlement, which was recorded as a decrease in the purchase price and goodwill.

The Company recorded the following assets acquired and liabilities assumed related to BioStorage at their fair values as of the acquisition date, from a market participant's perspective (in thousands):

	Fair Value of Assets and Liabilities
Accounts receivable	$ 16,942
Prepaid expenses and other current assets	321
Property, plant and equipment	14,345
Intangible assets	41,460
Goodwill	79,639
Other assets	53
Debt assumed	(385)
Accounts payable	(1,708)
Accrued liabilities	(9,423)
Deferred revenue	(1,766)
Long-term deferred tax liabilities	(14,169)
Other liabilities	(61)
Total purchase price, net of cash acquired	$ 125,248

At the acquisition date, a cash payment of $5.4 million was placed into escrow which consisted of $2.9 million ascribed to the purchase price and $2.5 million related to retention arrangements with certain employees. The escrow balance was reduced by its full amount by the third quarter of fiscal year 2017.

The Company applied variations of the income approach to estimate the fair values of the intangibles assets acquired. The identified intangible assets include customer relationship (excess-earnings method) of $36.6 million with a useful life of 11.0 years, and trademark (relief-from-royalty method) of $4.9 million with a useful life of 8.0 years. The intangible assets acquired are amortized over the total weighted average period of 10.6 years using an accelerated depreciation method which approximates the pattern in which the economic benefits are expected to be realized.

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

The operating results of BioStorage have been reflected in the results of operations for the Brooks Life Sciences segment. During fiscal year 2018, revenue and net income from BioStorage recognized in the Company's results of operations were $74.7 million and $12.6 million, respectively. During fiscal year 2017, revenue and net income from BioStorage recognized in the Company's results of operations were $62.8 million and $9.3 million, respectively. During fiscal year 2016, revenue and net income from BioStorage recognized in the Company's results of operations were $44.6 million and $2.4 million, respectively. During fiscal years ended September 30, 2018, 2017 and 2016, the net income included amortization expense of $5.5 million, $4.6 million and $2.9 million, respectively, related to acquired intangible assets.

During fiscal years ended September 30, 2018, 2017 and 2016, the Company incurred $0.3 million, $0.3 million and $3.2 million, respectively, in non-recurring transaction costs with respect to the BioStorage acquisition. The retention payment of $2.5 million was recorded within prepaid expenses and other current assets at the acquisition date and is recognized as a compensation expense over the service period or upon a triggering event in the underlying change in control agreements. The retention payments were completed paid out by the first quarter of fiscal year 2017.

The following unaudited proforma financial information represents a summary of the consolidated results of operations for the Company and BioStorage for fiscal year 2016 as if the acquisition of BioStorage occurred on October 1, 2014 (in thousands):

	Year Ended September 30, 2016
Revenue	$ 445,058
Net loss	(79,377)
Basic loss per share	$ (1.16)
Diluted loss per share	$ (1.16)
Weighted average shares outstanding used in computing net loss per share:	
Basic	68,507
Diluted	68,507

The unaudited pro forma information presented above reflects historical operating results of the Company and BioStorage and includes the impact of certain adjustments directly attributable to the business combination. The unaudited pro forma financial information is presented for informational purposes only and is not necessarily indicative of the results of operations that would have been achieved if the acquisition of BioStorage had taken place on October 1, 2014. During fiscal years ended September 30, 2016, the adjustments reflected in the unaudited pro forma information included aggregate amortization and depreciation expense of $0.6 million, and tax effects of $0.5 million. Additionally, the impact of restructuring charges of $1.9 million was excluded from the proforma net loss during fiscal year ended September 30, 2016.

5. Marketable Securities

The Company invests in marketable securities that are classified as available-for-sale and recorded at fair value in the Company's 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.

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 Consolidated Statements of Operations. During fiscal year 2018, the Company sold marketable securities with a fair value and amortized cost of $1.6 million each and recognized nominal net losses. The Company collected

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cash proceeds of approximately $1.6 million from the sale of marketable securities and reclassified unrealized net holding losses of $0.1 million from accumulated other comprehensive income into "Other expenses, net" in the accompanying Consolidated Statements of Operations as a result of these transactions. During fiscal year 2017, the Company sold marketable securities with fair values and amortized cost of $3.6 million each and recognized net losses of less than $0.1 million. The Company collected cash proceeds of $3.5 million from the sale of marketable securities and reclassified unrealized net holding losses of approximately $0.1 million from accumulated other comprehensive income into "Other (expense) income, net" in the accompanying 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, as well as unrealized holding gains (losses) on the short-term and long-term marketable securities as of September 30, 2018 and 2017 (in thousands):

	Amortized Cost	Gross Unrealized Losses	Gross Unrealized Gains	Fair Value
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
September 30, 2017:				
Corporate securities	$ 2,642	$ —	$ —	$ 2,642
Other debt securities	28	—	—	28
	$ 2,670	$ —	$ —	$ 2,670

The fair values of the marketable securities by contractual maturities at September 30, 2018 are presented below (in thousands).

	Fair Value
Due in one year or less	$ 46,281
Due after one year through five years	4,373
Due after five years through ten years	—
Due after ten years	2,864
Total marketable securities	$ 53,518

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

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 fair value and recognizes the credit loss in earnings and the non-credit loss in accumulated other comprehensive income. There were no marketable securities in unrealized loss position as of September 30, 2017. As of September 30, 2018, aggregate fair value of the marketable securities in unrealized loss position was $43.0 million and was comprised primarily of U.S. Treasury securities, corporate securities, and municipal securities. Aggregate unrealized losses for these securities were insignificant as of September 30, 2018 and are presented in the table above. The securities in 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.

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6. Property, Plant and Equipment

Property, plant and equipment were as follows as of September 30, 2018 and 2017 (in thousands):

	September 30, 2018	2017
Buildings and land	$ 47,745	$ 46,608
Computer equipment and software	56,982	55,352
Machinery and equipment	55,794	48,647
Furniture and fixtures	4,842	4,034
Leasehold improvements	19,433	18,045
Capital projects in progress	5,796	2,761
	190,592	175,447
Less: accumulated depreciation and amortization	(130,604)	(118,466)
Property, plant and equipment, net	$ 59,988	$ 56,981

Depreciation expense was $12.5 million, $10.1 million and $12.2 million, respectively, for the fiscal years ended September 30, 2018, 2017 and 2016. The Company recorded $0.9 million of additions to property, plant and equipment for which cash payments had not yet been made as of September 30, 2018.

7. 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. The Company elected April 1st as its annual goodwill impairment assessment date. If the existence of events or circumstances indicates that it is more likely than not that fair values of the reporting units are below their carrying values, the Company performs additional impairment tests during interim periods to evaluate goodwill for impairment.

In accordance with ASC 350, the Company initially assesses qualitative factors to determine whether the existence of events or circumstances indicates that it is more likely than not that the fair value of a reporting unit is less than its carrying value. If the Company determines, based on this assessment, that it is more likely than not that the fair value of the reporting unit is less than its carrying value, it performs a quantitative goodwill impairment test by comparing the reporting unit's fair value with its carrying value. An impairment loss is recognized for the amount by which the reporting unit's carrying value exceeds its fair value, up to the total amount of goodwill allocated to the reporting unit. No impairment loss is recognized if the fair value of the reporting exceeds its carrying value.

The Company completed its annual goodwill impairment test as of April 1, 2018 and determined that no adjustment to goodwill was necessary since the fair value of each reporting unit was significantly in excess of the carrying value of each reporting unit. The Company conducted a qualitative assessment for three reporting units within the Brooks Semiconductor Solutions Group segment and determined that it was not likely that their fair values were less than their carrying values. As a result of the analysis, the Company did not perform the quantitative assessment for these reporting units and did not recognize impairment losses. The Company also performed the quantitative goodwill impairment test for the fourth reporting unit within the Brooks Semiconductor Solutions Group segment and for the Brooks Life Sciences reporting unit. The Company determined that no adjustment to goodwill was necessary for these two reporting units since their fair values significantly exceeded their respective carrying values. If events occur or circumstances change that would more likely than not reduce the fair value of any reporting unit below its carrying value, the Company will evaluate such reporting unit’s goodwill for impairment between annual tests.

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The following table sets forth the changes in the carrying amount of goodwill by operating segment for the year ended September 30, 2018 and 2017 (in thousands):

	Brooks Semiconductor Solutions Group	Brooks Life Sciences	Other	Total
Gross goodwill, at September 30, 2016	$ 629,297	$ 135,301	$ 26,014	$ 790,612
Accumulated goodwill impairments	(588,944)	—	(26,014)	(614,958)
Goodwill, net of accumulated impairments, at September 30, 2016	40,353	135,301	—	175,654
Acquisitions and adjustments	(19)	31,519	—	31,500
Gross goodwill, at September 30, 2017	$ 629,278	$ 166,820	$ 26,014	$ 822,112
Accumulated goodwill impairments	(588,944)	—	(26,014)	(614,958)
Goodwill, net of accumulated impairments, at September 30, 2017	40,334	166,820	—	207,154
Acquisitions and adjustments	7,629	41,093	—	48,722
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

During fiscal year 2018, the Company recorded a goodwill increase of $41.0 million primarily related to the acquisitions of 4titude, TecSem and BioSpeciMan.

The components of the Company’s identifiable intangible assets as of September 30, 2018 and 2017 are as follows (in thousands):

	September 30, 2018			September 30, 2017		
	Cost	Accumulated Amortization	Net Book Value	Cost	Accumulated Amortization	Net Book Value
Patents	$ 5,302	$ 4,325	$ 977	$ 5,302	$ 4,019	$ 1,283
Completed technology	44,829	28,934	15,895	31,264	24,379	6,885
Trademarks and trade names	6,298	2,953	3,345	6,138	1,863	4,275
Customer relationships	142,489	62,750	79,739	115,596	44,535	71,061
	$ 198,918	$ 98,962	$ 99,956	$ 158,300	$ 74,796	$ 83,504

Amortization expense for intangible assets was $24.2 million, $17.1 million and $14.8 million, respectively, for the fiscal years ended September 30, 2018, 2017 and 2016.

Estimated future amortization expense for the intangible assets as of September 30, 2018 is as follows (in thousands):

Fiscal year ended September 30, 2019	$ 23,187

2020	21,061
2021	14,752
2022	11,839
2023	9,423
Thereafter	19,694
	$ 99,956

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8. Equity Method and Other Investments

The Company accounts for certain of its investments using the equity method of accounting and records its proportionate share of the investee’s earnings (losses) in its results of operations with a corresponding increase (decrease) in the carrying value of the investment.

BioCision, LLC

As of September 30, 2016, the Company held a 20% equity interest in BioCision, LLC, or BioCision, a privately-held company based in Larkspur, California, which was accounted for as an equity method investment. The carrying value of the investment in BioCision was $1.7 million at September 30, 2016. During fiscal years ended September 30, 2016, the Company recorded a loss associated with BioCision of $1.1 million.

The Company held a term loan receivable from BioCision as of September 30, 2016. The term loan was provided to BioCision to support its working capital requirements. The term loan had an aggregate principal amount of $1.5 million and bore an annual interest rate of 10%. At September 30, 2016, the term loan was recorded at its carrying value of $1.5 million and included in "Other assets" in the Company’s Consolidated Balance Sheets.

The Company also held five-year convertible debt securities with a warrant agreement to purchase BioCision’s preferred units as of September 30, 2016. The convertible debt securities and the warrant were purchased by the Company in fiscal year 2015 for a total purchase price of $5.0 million. The convertible debt securities were accruing interest at the annual rate of 9%, and all principal and accrued interest were due at maturity. The convertible debt securities and the warrant were recorded at fair value during each reporting period, and the remeasurement gains and losses were recognized as a component of "Other (expense) income, net" in the Company’s Consolidated Statements of Operations. During the fiscal year ended September 30, 2016, the Company recognized remeasurement gains of $0.4 million related to these financial instruments.

On November 28, 2016, BioCision established Cool Lab as its subsidiary upon transferring certain assets related to cell cryopreservation solutions. The Company acquired a 100% equity interest of the subsidiary on that date for an aggregate purchase price of $15.2 million, consisting of a cash payment of $4.8 million, a liability to the seller of $0.1 million, and non-cash consideration of $10.3 million measured at fair value on the acquisition date.

The carrying value of the equity method investment in BioCision was $1.2 million on November 28, 2016. The Company recorded a loss associated with BioCision of $0.5 million from October 1, 2016 through the acquisition date. The equity method investment in BioCision was measured at fair value of $3.1 million at the acquisition date, and as a result the Company recognized a gain of $1.8 million upon the redemption of the equity method investment in its Consolidated Statements of Operations during fiscal year ended September 30, 2017. On November 28, 2016, convertible debt, warrant and the term loan with carrying values of $5.8 million, less than $0.1 million and $1.6 million, respectively, were measured at their fair values of $5.6 million, less than $0.1 million and $1.6 million, respectively. As a result of such measurement, the Company recognized an aggregate loss of $0.2 million upon the settlement of these financial instruments in "Other (expense) income, net" in its Consolidated Statements of Operations during the year ended September 30, 2017. Please refer to Note 4, "Acquisitions" for further information on the acquisition transaction.

9. Supplementary Balance Sheet Information

The following is a summary of accounts receivable at September 30, 2018 and 2017 (in thousands):

	September 30, 2018	2017
Accounts receivable	$ 126,350	$ 94,927
Less allowance for doubtful accounts	(1,113)	(1,381)
Less allowance for sales returns	(45)	(81)
Accounts receivable, net	$ 125,192	$ 93,465

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The allowance for doubtful accounts activity for the fiscal years ended September 30, 2018, 2017 and 2016 is as follows (in thousands):

Description	Balance at Beginning of Period	Provisions	Reversals of Bad Debt Expense	Write-offs and Adjustments	Balance at End of Period
2018 Allowance for doubtful accounts	$ 1,381	$ 708	$ (724)	$ (252)	$ 1,113
2017 Allowance for doubtful accounts	1,543	—	(131)	(31)	1,381
2016 Allowance for doubtful accounts	332	143	48	1,020	1,543

The allowance for sales returns activity for the fiscal years ended September 30, 2018, 2017 and 2016 is as follows (in thousands):

Description	Balance at Beginning of Period	Provisions	Write-offs and Adjustments	Balance at End of Period
2018 Allowance for sales returns	$ 81	$ (36)	$ —	$ 45
2017 Allowance for sales returns	101	(20)	—	81
2016 Allowance for sales returns	115	(14)	—	101

The following is a summary of inventories at September 30, 2018 and 2017 (in thousands):

	September 30, 2018	2017
Inventories		
Raw materials and purchased parts	$ 57,527	$ 53,234
Work-in-process	19,547	7,120
Finished goods	19,912	13,043
Total inventories	$ 96,986	$ 73,397

The activity for excess and obsolete inventory reserves is as follows for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

Description	Balance at Beginning of Period	Provisions	Inventory Disposals and Adjustments	Balance at End of Period
2018 Reserves for excess and obsolete inventory	$ 17,734	$ 4,455	$ (7,236)	$ 14,953
2017 Reserves for excess and obsolete inventory	19,663	4,858	(6,787)	17,734
2016 Reserves for excess and obsolete inventory	19,603	5,754	(5,694)	19,663

The activity for valuation allowance for deferred tax assets is as follows for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

Description	Balance at Beginning of Period	Charged to Provisions	Charged to Other Accounts	Balance at End of Period
2018 Valuation allowance for deferred tax assets	$ 92,297	$ (72,842)	$ (874)	$ 18,581
2017 Valuation allowance for deferred tax assets	104,802	(10,881)	(1,624)	92,297
2016 Valuation allowance for deferred tax assets	18,797	77,531	8,474	104,802

The Company establishes reserves for estimated cost 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,

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excluding amounts related to discontinued operations, for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	Amount
Balance at September 30, 2015	$ 4,255
Accruals for warranties during the year	5,851
Costs incurred during the year	(5,947)
Balance at September 30, 2016	4,159
Accruals for warranties during the year	6,683
Costs incurred during the year	(5,363)
Balance at September 30, 2017	5,479
Accruals for warranties during the year	5,209
Costs incurred during the year	(4,348)
Balance at September 30, 2018	$ 6,340

10. Line of Credit

On May 26, 2016, the Company and certain of its subsidiaries entered into a credit agreement with Wells Fargo Bank, N.A. (the "Wells Fargo"). The credit agreement provided for a five-year senior secured revolving line of credit (the ‘‘line of credit") of $75.0 million. The agreement included sub-limits of up to $25.0 million for letters of credit and $7.5 million of swing loans at the time there is more than one lender under the credit agreement.

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 line of credit matures on October 4, 2022 and expires no less than 90 days prior to the term loan expiration.

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 (“guarantor”), 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.

There were no amounts outstanding under the line of credit as of September 30, 2018 and September 30, 2017. The Company records commitment fees and other costs directly associated with obtaining line of credit financing as deferred financing costs, which are amortized over the term of the related financing arrangement. Deferred financing costs were $0.5 million at both September 30, 2018 and September 30, 2017. 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 September 30, 2018 and September 30, 2017.

11. Debt

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. The Company incurred additional deferred financing costs of $0.4 million during the year ended September 30, 2018. The loan proceeds are to be used for general corporate purposes, including acquisitions. 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.

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Under the term loan agreement, the Company may elect for the loan to bear an interest rate as Eurodollar Borrowings or as Alternate Base Rate Borrowings. Interest applicable to Eurodollar Borrowings is based on the Adjusted LIBO Rate plus applicable margin of 2.50%. The Adjusted LIBO Rate is the rate appearing on Bloomberg screen LIBOR01 which gets reset at the beginning of each selected interest period based on the LIBOR rate then in effect. Interest applicable to ABR Borrowings is based on the Alternate Base Rate plus applicable margin of 1.50%. Alternate Base Rate is determined based on the highest of: (a) the federal funds effective rate plus 0.50%, (b) prime rate plus 1.00%, or (c) one-month LIBOR rate plus 1.00%.

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 is 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 Company records commitment fees and other costs directly associated with obtaining term loan financing as deferred financing costs which are presented as a reduction of the term loan principal balance. Such costs are accreted over the term of the loan using the effective interest rate method. At September 30, 2018, deferred financing costs were $2.4 million.

During the year ended September 30, 2018, the weighted average stated interest rate paid on the term loan was 4.4%. During the year ended September 30, 2018, the Company incurred aggregate interest expense of $9.1 million in connection with the term loan borrowings, including $0.4 million of deferred financing costs amortization.

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 September 30, 2018, the Company was in compliance with all covenants and conditions under the term loan agreement.

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The following are the future minimum principal payment obligations under the term loan as of September 30, 2018:

The

	Amount
Fiscal year ended September 30,	
2019	$ 2,000
2020	2,000
2021	2,000
2022	2,000
2023	2,000
Thereafter	188,500
Total outstanding principal balance	198,500
Unamortized deferred financing costs	(2,429)
	196,071
Term loan, current portion	2,000
Term loan, long-term portion	$ 194,071

As of September 30, 2018, estimated fair value of the term loan outstanding principal balance 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.

On November 15, 2018, in connection with the closing of the GENEWIZ Group ("GENEWIZ") acquisition, the Company entered into an amendment of the existing term loan agreement which increased its outstanding principal balance to $546.0 million. Please refer to Note 23, "Subsequent Events", for further information on the term loan transaction and the acquisition.

12. Income Taxes

The components of the income tax provision (benefit) from continuing operations for the fiscal years are as follows (in thousands):

	Year Ended September 30,		
	2018	2017	2016
Current income tax provision (benefit):			
Federal	$ —	$ —	$ (145)
State	917	402	(193)
Foreign	7,608	7,499	4,709
Total current income tax provision	8,525	7,901	4,371
Deferred income tax provision (benefit):			
Federal	(48,815)	(4,247)	59,906
State	(5,518)	(249)	4,000
Foreign	(1,443)	(25)	(2,027)
Total deferred income tax provision (benefit)	(55,776)	(4,521)	61,879
Income tax provision (benefit)	$ (47,251)	$ 3,380	$ 66,250

The components of income (loss) from continuing operations before income taxes and equity in earnings of equity method investments for the fiscal years are as follows (in thousands):

	Year Ended September 30,		
	2018	2017	2016
Domestic	$ 3,122	$ (13,211)	$ (26,775)
Foreign	17,344	27,731	8,633
	$ 20,466	$ 14,520	$ (18,142)

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The differences between the income tax provision (benefit) on income (loss) from continuing operations including income from equity in earnings (losses) of equity method investments and income taxes computed using the applicable U.S. statutory federal tax rates for the fiscal years ended September 30, 2018, 2017 and 2016 are as follows (in thousands):

	Year Ended September 30,		
	2018	2017	2016
Income tax provision computed at federal statutory rate	$ 5,014	$ 4,923	$ (6,722)
State income taxes, net of federal benefit	692	137	(374)
Foreign income taxed at different rates	920	(1,644)	(690)
Impact of investments in subsidiaries	(729)	(965)	(971)
Change in deferred tax asset valuation allowance	(75,918)	319	76,486
Net increase (reduction) in uncertain tax positions	220	731	(1,543)
Impact of U.S. federal tax rate change	15,287	—	—
Compensation	(701)	579	743
Tax credits	(1,633)	(1,151)	(1,555)
Merger costs	1,405	—	503
Transition Tax	8,027	—	—
Other	165	451	373
Income tax provision (benefit)	$ (47,251)	$ 3,380	$ 66,250

The Company has not provided income taxes on the outside basis differences of its foreign subsidiaries consistent with the indefinite reinvestment assertion. As of September 30, 2018, the cumulative unremitted earnings contributing to the outside basis difference amounted to approximately $164.0 million. The basis difference for U.S. tax purposes is lower because the Company has U.S. tax basis in the foreign earnings as a result of the toll charge recognized during fiscal year 2018. The foreign earnings are expected to be reinvested in foreign operations and acquisitions. The Company has not accrued foreign withholding tax costs on unremitted earnings.

The significant components of the net deferred tax assets and liabilities as of September 30, 2018 and 2017 are as follows (in thousands):

	September 30,	
	2018	2017
Accruals and reserves not currently deductible	$ 14,581	$ 18,747
Federal, state and foreign tax credits	27,923	25,413
Other assets	175	42
Equity compensation	5,926	7,615
Net operating loss carryforwards	16,790	50,882
Inventory reserves and valuation	6,520	9,847
Deferred tax assets	71,915	112,546
Depreciation and intangible amortization	(19,476)	(21,200)
Deferred tax liabilities	(19,476)	(21,200)
Valuation allowance	(18,581)	(93,402)
Net deferred tax asset (liability)	$ 33,858	$ (2,056)

The deferred tax assets on the balance sheet for September 30, 2018 also includes a $2.8 million deferred tax charge related to the company's intercompany profit elimination. This amount is included in the net deferred tax asset recorded on the balance sheet.

ASC Topic 740, Income Taxes, requires that all available evidence, both positive and negative, be considered in determining, based on the weight of that evidence, whether a valuation allowance is needed. The weight given to the potential effect of negative and positive evidence should be commensurate with the extent to which it can be objectively verified. The more negative evidence that exists, (a) the more positive evidence is necessary and (b) the more difficult it is to support a conclusion that a valuation allowance is not needed for some portion or the entire deferred tax asset. A

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cumulative loss in recent years is considered a significant piece of negative evidence that is difficult to overcome in assessing the need for a valuation allowance.

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 in the course of performing this analysis. The Company evaluated all positive and negative evidence in concluding it was appropriate to establish a full valuation allowance against U.S. net deferred tax assets during fiscal year 2016. The company maintained this position throughout fiscal year 2017 and the first quarter of fiscal year 2018.

After evaluating all the relevant positive and negative evidence as of March 31, 2018, the Company concluded that it was more likely than not that a substantial portion of the U.S. deferred tax assets would be realized. In the second quarter of fiscal year 2018 the Company reached a significant level of cumulative profitability in the U.S., coupled with an improved outlook of U.S. earnings. During the full fiscal year 2018, the Company reduced its U.S. valuation against its U.S. net deferred tax assets resulting in a tax benefit of $77.2 million. 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 the end of fiscal year 2018.

As of September 30, 2018, the Company had state and foreign net operating loss carry-forwards of approximately $67.4 million and $58.7 million, respectively. The state net operating losses are generated in various jurisdictions with different carryover periods and expire starting in 2019 through 2035. Certain foreign net operating loss carryovers will begin to expire in 2019.

As of September 30, 2018, the Company had federal research and development tax credit carry-forwards of $20.4 million. These credit carry-forwards will expire at various dates beginning in 2019 through 2038. The Company also has $11.0 million of state credits which begin to expire in 2019, while some of these credits have an unlimited carryover period.

During the fiscal year 2018, the Tax Cuts and Jobs Act (“Tax Reform”) was enacted in the U.S., making significant tax law changes affecting the Company. The SEC issued Staff Accounting Bulletin 118 (“SAB 118”), which provided guidance for companies that had not completed the accounting for the income tax effects of Tax Reform. Under SAB 118, a company may report provisional amounts based on reasonable estimates where the accounting is incomplete. These amounts are subject to adjustments during a measurement period of up to one year beginning in the reporting period of the enactment date.

Upon the enactment of Tax Reform, the Company is subject to a toll charge in the U.S. on its previously untaxed accumulated foreign earnings. The Company recorded a tax impact of $8.0 million, net of foreign tax credits, related to the toll charge during the fiscal year ended September 30, 2018. There are still incomplete components related to the accumulated foreign earnings and tax pools for older tax years that require additional time to analyze the data and complete the calculations. The Company will continue to refine these calculations through the quarter ended December 31, 2018 and continue to monitor legislative updates and clarifications and the related impact to the toll charge as recorded during the fiscal year 2018. The Company did not record any current cash U.S. federal tax provision for the toll charge because sufficient net operating loss carryovers and tax credits exist to offset the resulting tax.

The Company has performed studies to determine if there are any annual limitations on the federal net operating losses under the Section 382 of the Internal Revenue Code of 1986, as amended, or the Internal Revenue Code. As a result of these studies, the Company has determined that ownership changes have occurred primarily in connection with acquisitions when the Company has issued stock to the sellers, as well as ownership changes in the subsidiaries acquired by the Company. Certain limitations have been calculated, and the benefits of the net operating losses that will expire before utilization have not been recorded as deferred tax assets in the accompanying Consolidated Balance Sheets.

The Company maintains liabilities for uncertain tax positions. These liabilities involve judgment and estimation and are monitored based on the best information available. A reconciliation of the beginning and ending amount of the

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consolidated liability for unrecognized income tax benefits during the fiscal years ended September 30, 2018, 2017 and 2016 is as follows (in thousands):

	Total
Balance at September 30, 2015	$ 2,191
Reductions from settlements with taxing authorities	4,165
Reductions from lapses in statutes of limitations	(897)
Foreign exchange rate adjustment	(32)
Balance at September 30, 2016	5,427
Additions for tax positions in current year	1,869
Reduction for tax positions in prior year	(3,485)
Net reductions from lapses in statutes of limitations	(431)
Foreign exchange rate adjustment	(2)
Balance at September 30, 2017	3,378
Additions for tax positions in current year	874
Reduction for tax positions in prior year	(656)
Reductions from lapses in statutes of limitations	(353)
Balance at September 30, 2018	$ 3,243

Included in the ending balance of unrecognized tax benefits for the fiscal year ended September 30, 2018 are $3.0 million of tax benefits that if recognized would impact the effective tax rate. The Company recognizes interest related to unrecognized benefits as a component of the income tax provision (benefit), of which $0.1 million, $0.1 million and $0.1 million, respectively, was recognized for the fiscal years ended September 30, 2018, 2017 and 2016. The statute of limitations lapsed on several uncertain tax positions in the foreign jurisdictions during fiscal year 2018 that resulted in a $0.7 million reduction in 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.

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 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 in the next 12 months.

13. 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. These transactions and balances, including short-term advances between the Company and its subsidiaries, subject the Company's operations to exposure from exchange rate fluctuations. The impact of currency exchange rate movement can be positive or negative in any period. The Company mitigates the impact of potential currency transaction gains and losses on short-term intercompany advances through timely settlement of each transaction, generally within 30 days.

The Company also enters into foreign exchange contracts to reduce its exposure to currency fluctuations. Under forward contract arrangements, the Company typically agrees to purchase a fixed amount of one currency in exchange for a fixed amount of another currency on specified dates with maturities of 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

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(expense) income, net" in the accompanying Consolidated Statements of Operations and are as follows for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	Fiscal Year Ended September 30,		
	2018	2017	2016
Realized gains (losses) on derivatives not designated as hedging instruments	$ (330)	$ (545)	$ 1,434

The fair value of derivative instruments are as follows at September 30, 2018 and 2017 (in thousands):

	Fair Value of Assets		Fair Value of Liabilities	
As of September 30,	2018	2017	2018	2017
Derivatives not designated as hedging instruments				
Foreign exchange contracts	$ 170	$ 4	$ (177)	$ (146)
Total	$ 170	$ 4	$ (177)	$ (146)

The fair values of the forward contracts described above are recorded in the Company’s accompanying Consolidated Balance Sheets as "Prepaid expenses and other current assets" and "Accrued expenses and other current liabilities".

14. Postretirement Benefits

Defined Benefit Pension Plans

The Company has three active defined benefit pension plans (collectively, the “Plans”), including legacy Taiwan Plan, the legacy Switzerland Plan, and the newly acquired Tec-Sem Plan. The Plans cover substantially all of the Company’s employees in Switzerland and Taiwan. Retirement benefits are generally earned based on years of service and the level of compensation during active employment, but the level of benefits varies within the Plans. Eligibility is determined in accordance with local statutory requirements.

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The Company uses September 30th as a measurement date to determine net periodic benefit costs, benefit obligations and the value of plan assets for all plans. The following tables set forth the funded status and amounts recognized in the Company's Consolidated Balance Sheets as of September 30, 2018 and 2017 (in thousands):

	September 30, 2018	September 30, 2017
Benefit obligation at beginning of fiscal year	$ 3,565	$ 6,444
Benefit obligation through acquisition	7,852	—
Service cost	382	268
Interest cost	75	22
Actuarial loss	(165)	(601)
Benefits paid	(685)	—
Employee contributions	191	—
Settlements paid	—	(2,526)
Foreign currency translation	(71)	(42)
Benefit obligation at end of fiscal year	$ 11,144	$ 3,565
Fair value of assets at beginning of fiscal year	$ 2,225	$ 4,532
Fair value of assets through acquisition	5,052	—
Actual return on plan assets	69	55
Disbursements	(685)	(51)
Employer contributions	266	153
Employee contributions	191	101
Settlements paid	—	(2,526)
Foreign currency translation	(40)	(39)
Fair value of assets at end of fiscal year	$ 7,078	$ 2,225
Accrued benefit obligation	$ 4,066	$ 1,340

The accumulated benefit obligation of the Plans is $10.6 million and $3.1 million, respectively, at September 30, 2018 and 2017. All Plans have an accumulated benefit obligation and projected benefit obligation in excess of plans' assets at September 30, 2018.

The following table provides pension-related amounts and their classification within the accompanying Consolidated Balance Sheets as of September 30, 2018 and 2017 (in thousands):

	September 30, 2018	September 30, 2017
Accrued compensation and benefits	$ 431	$ 112
Long-term pension liability	3,635	1,228
	$ 4,066	$ 1,340

The Company bases its determination of pension expense on a market-related valuation of assets, which reduces year-to-year volatility. This market-related valuation recognizes investment gains or losses over a five-year period from the year in which they occur. Investment gains or losses represent the difference between the expected return calculated using the market-related value of assets and the actual return on assets. Since the market-related value of assets recognizes gains or losses over a five-year period, the future value of assets will be impacted as previously deferred gains or losses are recognized. At September 30, 2018 and 2017, the Company had cumulative unrecognized net actuarial gains less than $0.1 million and $0.4 million, respectively, which are amortized into net periodic benefit cost over the average remaining service period of active Plans’ participants. At September 30, 2018 and 2017, the Company had cumulative unrecognized investment gains of $0.5 million and losses of $0.1 million, respectively, under the Plans which remain to be recognized in the calculation of the market-related values of assets.

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The components of the Company's net pension cost for the fiscal years ended September 30, 2018, 2017 and 2016 are as follows (in thousands):

	Year Ended September 30,		
	2018	2017	2016
Service cost	$ 382	$ 268	$ 546
Interest cost	75	22	66
Amortization of losses	5	7	1
Expected return on plan assets	(66)	(130)	(156)
Net periodic pension cost	$ 396	$ 167	$ 457
Curtailment gain	—	—	(227)
Settlement (gain) loss	—	(259)	—
Total pension cost (gain)	$ 396	$ (92)	$ 230

The following changes in Plans' assets and benefit obligations were recognized in other comprehensive income (loss) as of September 30, 2018 and 2017 (in thousands):

	September 30,	
	2018	2017
Net (gain) loss	$ (191)	$ (577)
Amortization of net loss	(7)	(7)
Curtailment gain	—	—
Settlement gain	—	259
Total recognized in other comprehensive income (loss)	(198)	(325)
Total recognized in net periodic pension cost and other comprehensive income (loss)	$ 593	$ 491

The settlement gain of $0.3 million realized during fiscal year ended September 30, 2017 was recorded as a reduction of accumulated other comprehensive income (loss) and the pension cost during the period then ended. The curtailment gain of $0.2 million incurred during fiscal years ended September 30, 2016 was reclassified from accumulated other comprehensive income (loss) into the results of operations during fiscal year 2016. Additionally, a curtailment gain of $1.1 million was recognized as a reclassification from accumulated other comprehensive income and a corresponding reduction in pension liabilities during fiscal year ended September 30, 2016. Please refer to Note 15, "Stockholders' Equity", for further information on these reclassifications and their impact on the accumulated other comprehensive income and other comprehensive income during each fiscal year.

Weighted-average assumptions used to determine the projected benefit obligation for the fiscal years ended September 30, 2018, 2017 and 2016 are as follows:

	Year Ended September 30,		
	2018	2017	2016
Discount rate	1.04 %	0.88 %	0.40 %
Expected return on plan assets	1.06 %	1.75 %	1.75 %
Expected rate of compensation increases	1.19 %	1.54 %	1.31 %

In selecting the appropriate discount rates for the Plans, the Company uses country-specific information, adjusted to reflect the duration of the particular plan. The expected return on plan assets is based on an evaluation of fixed income yield curves and equity return assumption studies applied to the Plans' asset allocations.

Plan Assets

The fair value of plan assets for the two Swiss Plans and the Taiwan Plan were $6.8 million and $0.3 million, respectively, at September 30, 2018. The assets of the Swiss Plans are invested in a collective fund with multiple employers through a Swiss insurance company, which is a customary practice for Swiss pension plans. The Company

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does not have any rights or an investment authority over the Plan’s assets which are invested primarily in highly rated debt securities.

The assets of the Taiwan Plan are invested with a trustee selected by the Taiwan government, and the Company has no investment authority over the Plan’s assets.

The allocation of the Plans’ assets at September 30, 2018 is as follows:

	September 30, 2018	
Cash and cash equivalents	3	%
Debt securities	69	
Equity securities	6	
Other	22	
	100	%

The fair values of pension assets by asset category and by level at September 30, 2018 are as follows (in thousands):

	As of September 30, 2018			
	Level 1	Level 2	Level 3	Total
Swiss Life collective foundation	$ —	$ 6,754	$ —	$ 6,754
Taiwan collective trust	—	324	—	324
Total	$ —	$ 7,078	$ —	$ 7,078

The fair values of pension assets by asset category and by level at September 30, 2017 are as follows (in thousands):

	As of September 30, 2017			
	Level 1	Level 2	Level 3	Total
Swiss Life collective foundation	$ —	$ 1,886	$ —	$ 1,886
Taiwan collective trust	—	339	—	339
Total	$ —	$ 2,225	$ —	$ 2,225

Please refer to Note 21, "Fair Value Measurements" for a description of the levels of inputs used to determine fair value measurements.

Benefit payments expected to be paid over the next five fiscal years and thereafter are as follows (in thousands):

Fiscal year ended September 30,	
2019	$ 266
2020	253
2021	267
2022	297

2023	293
Thereafter	117

The Company expects to contribute $0.3 million to the Plans in fiscal year 2019 to meet the minimum funding requirements of the Plans.

Defined Contribution Plans

The Company sponsors a defined contribution plan that meets the requirements of Section 401(k) of the Internal Revenue Code. All United States employees who meet minimum age and service requirements are eligible to participate in the plans. The plans allow employees to invest, on a pre-tax basis, a percentage of their annual salary and bonus subject to statutory limitations. The Company matches a portion of their contributions on a pre-tax basis up to a maximum amount of 4.5% of deferred pay. The expense recognized for the defined contribution plans was $3.4 million, $3.0 million and $3.1 million, respectively, for the fiscal years ended September 30, 2018, 2017 and 2016.

15. Stockholders' Equity

Preferred Stock

Total number of shares of preferred stock authorized for issuance was 1,000,000 shares at September 30, 2018 and 2017, respectively. Preferred stock has a par value of $0.01 per share and may be issued at the discretion of the Board of Directors without stockholder approval with such designations, rights and preferences as the Board of Directors may determine. There were no shares of preferred stock issued or outstanding at September 30, 2018 or 2017, respectively.

Accumulated Other Comprehensive Income

The following is a summary of the components of accumulated other comprehensive income, net of tax, at September 30, 2018, 2017 and 2016 (in thousands):

	Currency Translation Adjustments	Unrealized Gains (Losses) on Available-for-Sale Securities	Pension Liability Adjustments	Total
Balance at September 30, 2015	$ 6,545	$ 103	$ (750)	$ 5,898
Other comprehensive (loss) income before reclassifications	8,844	(231)	(322)	8,291
Amounts reclassified from accumulated other comprehensive income	—	125	852	977
Balance at September 30, 2016	15,389	(3)	(220)	15,166
Other comprehensive income (loss) before reclassifications	(221)	(10)	514	283
Amounts reclassified from accumulated other comprehensive income	—	12	(248)	(236)
Balance at September 30, 2017	15,168	(1)	46	15,213
Other comprehensive (loss) income before reclassifications	(1,651)	(110)	124	(1,637)
Amounts reclassified from accumulated other comprehensive income	—	(1)	12	11
Balance at September 30, 2018	$ 13,517	$ (112)	$ 182	$ 13,587

Unrealized net holding gains (losses) on available-for-sale marketable securities are reclassified from accumulated other comprehensive income into results of operations at the time of the securities' sale, as described in Note 5, "Marketable Securities." Gains (losses) related to defined benefit pension plan settlements are reclassified from accumulated other comprehensive income into results of operations at the time of the settlement, as described in Note 14, "Postretirement Benefits." Defined benefit pension plan curtailments are recognized as reclassifications from accumulated other comprehensive income and corresponding reductions in pension liabilities and net pension cost, as described in Note 14, "Postretirement Benefits."

16. Equity Incentive Plans

The Company’s equity incentive plans are intended to attract and retain employees and provide an incentive for them to contribute to the Company’s long-term growth and achievement of its long-range performance goals. The equity incentive plans consist of plans under which employees may be granted options to purchase shares of the Company’s stock, restricted stock and other equity incentives. Restricted stock awards generally have a three-year vesting period. At September 30, 2018, a total of 3,006,971 shares were reserved and available for future grant under the equity incentive plans.

2015 Equity Incentive Plan

In accordance with the 2015 Equity Incentive Plan (the “2015 Plan") provisions, the Company may grant (i) restricted stock and other stock-based awards, (ii) nonqualified stock options, and (iii) options intended to qualify as incentive stock options under Section 422 of the Internal Revenue Code. All employees of the Company or any affiliate

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of the Company, independent directors, consultants and advisors are eligible to participate in the 2015 Plan. The 2015 Plan provides for the issuance of a maximum of 5,000,000 shares of common stock in addition to the stock option and restricted stock awards granted out of the 2000 Plan that were canceled or forfeited after February 5, 2015 upon expiration of the 2000 Plan on March 31, 2015.

Restricted Stock Activity

The following table summarizes restricted stock unit activity for the fiscal year ended September 30, 2018:

	Shares	Weighted Average Grant-Date Fair Value
Outstanding at September 30, 2017	2,474,011	$ 12.34
Granted	535,289	33.28
Vested	(732,356)	12.78
Forfeited	(82,432)	16.51
Outstanding at September 30, 2018	2,194,512	$ 17.20

The weighted average grant date fair value of restricted stock units granted during fiscal years 2018, 2017 and 2016 was $33.28, $14.43 and $10.84 per share, respectively. The fair value of restricted stock units vested during fiscal years 2018, 2017 and 2016 was $22.0 million, $15.0 million and $14.3 million, respectively. During fiscal years 2018, 2017 and 2016, the Company remitted $7.3 million, $4.7 million and $4.4 million, respectively, for withholding taxes on vested restricted stock units, of which $0.0 million, $0.1 million and $4.3 million, respectively, was paid by the Company. During fiscal years 2018, 2017 and 2016, the Company received $7.3 million, $4.6 million and $0.1 million, respectively, in cash proceeds from employees to satisfy their tax obligations as a result of share issuances.

As of September 30, 2018, the future unrecognized stock-based compensation expense related to restricted stock units expected to vest is $20.7 million and is expected to be recognized over an estimated weighted average amortization period of 1.5 years.

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 goals. The following table reflects restricted stock units and stock awards granted during fiscal years ended September 30, 2018, 2017 and 2016:

	Total Units	Time-Based Units	Stock Grants	Performance-Based Units
Year ended September 30, 2018	535,289	213,893	36,774	284,622
Year ended September 30, 2017	1,018,570	386,713	43,519	588,338
Year ended September 30, 2016	1,690,582	744,250	86,082	860,250

Among the total restricted stock units granted, 134,993, 124,124, and 109,876 shares, respectively, were granted to the employees who belong to the discontinued operations in the year ended September 30, 2018, 2017 and 2016. As of November 7, 2018, only 61,000 shares granted to these employees were not vested and expected to be vested upon the closing of the Disposition.

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.

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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.

Restricted stock awards granted during fiscal year 2018 and 2017 are subject to a one-year vesting period. Restricted stock awards granted during fiscal years 2016 vested on the grant date upon issuance.

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. Annual restricted stock units granted during fiscal years 2018 and 2017 are subject to a one-year vesting period. Annual restricted stock units granted during fiscal year 2016 vested on the grant date upon issuance.

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 are weighted and have threshold, target and maximum performance goals.

Performance-based awards granted in fiscal year 2018, 2017 and 2016 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 the maximum or stretch goal. Performance below the minimum threshold for each financial metric results in award forfeitures. Performance goals will be measured over a three-year period for each plan and at the end of the period to determine the number of units earned by recipients who continue to meet the service requirement. 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.

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. On February 8, 2017, the stockholders approved the 2017 Employee Stock Purchase Plan (the "2017 Plan") to replace the 1995 Employee Stock Purchase Plan (the "1995 Plan") which was terminated upon the expiration of the offering period ending on July 31, 2017. The 2017 Plan allows for purchases by employees of up to 1,250,000 shares of the Company's common stock. As of September 30, 2018, 1,123,326 shares of common stock remain available for purchase under the 2017 Plan. During fiscal year ended September 30, 2018, the Company issued 126,674 shares under the 2017 Plan. During fiscal years 2017, the Company issued 162,360 shares under the 1995 Plan.

17. Restructuring and Other Charges

Fiscal Year 2018 Activities

During fiscal year 2018, the Company incurred restructuring charges of $0.7 million, primarily related to the planned closure of its Denmark facility and reduction in force at Tec-Sem.

During the fourth quarter of fiscal year 2018, the Company initiated an action to consolidate the operations at its Denmark facility into its operations at its Manchester, UK facility to eliminate cost redundancies. The $0.3 million charge resulted from the Denmark action was related to Brooks Life Sciences segment.

During the fourth quarter of fiscal year 2018, the Company also initiated a post-acquisition reduction in force plan at Tec-Sem to maximize synergies with the Company’s existing infrastructure. The $0.3 million charge resulted from the Tec-Sem action was related to the Brooks Semiconductor Solutions Group segment.

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Fiscal Year 2017 Activities

During fiscal year 2017, the Company recorded restructuring charges of $3.1 million related to severance, including $2.5 million attributable to the Brooks Semiconductor Solutions Group segment, $0.4 million attributable to the Brooks Life Sciences segment and $0.3 million attributable to the company-wide restructuring action.

The restructuring charges in the Brooks Semiconductor Solutions Group segment consisted of $1.5 million of charges related to the actions initiated during fiscal year 2017 to streamline field service operations and optimize the cost structure and improve productivity, and $1.0 million of charges related to the actions initiated prior to fiscal year 2017 primarily related to consolidate the Jena, Germany repair facility into the Chelmsford, Massachusetts repair operation.

Restructuring charges of $0.3 million were related to the company-wide restructuring action initiated in fiscal year 2016 to streamline business operations, improve competitiveness and overall profitability.

Fiscal Year 2016 Activities

The Company recorded restructuring charges of $10.2 million during fiscal year 2016 related to severance costs, including $8.9 million related to restructuring actions initiated during fiscal year 2016 and $1.3 million related to restructuring actions initiated in prior periods.

The Company's charges from restructuring actions initiated during fiscal year 2016 consisted of: (i) $3.1 million attributable to the Brooks Life Sciences segment to streamline the segment's management structure, integrate acquisitions, consolidate facility and improve profitability, (ii) $1.2 million attributable to the Brooks Semiconductor Solutions Group segment to consolidate its Jena, Germany repair facility into its Chelmsford, Massachusetts repair operation, and (iii) $4.5 million related to the company-wide restructuring action to streamline business operations, improve competitiveness and overall profitability.

The Company's charges from restructuring actions initiated in prior periods was primarily related to the Brooks Semiconductor Solutions segment to integrate Contact, and to close and transfer the Mistelgau, Germany manufacturing operations to a contract manufacturer.

The following is a summary of activity related to the Company's restructuring and other charges, excluding amounts related to the discontinued operations, for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	Activity - Year Ended September 30, 2018			
	Balance September 30, 2017	Expenses	Payments	Balance September 30, 2018
Total restructuring liabilities related to workforce termination benefits	$ 1,708	$ 714	$ (1,763)	$ 659

	Activity - Year Ended September 30, 2017			
	Balance September 30, 2016	Expenses	Payments	Balance September 30, 2017

Total restructuring liabilities related to workforce termination benefits	$ 5,939	3,144	(7,375)	1,708

	Activity - Year Ended September 30, 2016			
	Balance September 30, 2015	Expenses	Payments	Balance September 30, 2016
Facility and other contract termination costs	$ 433	$ 25	$ (458)	$ —
Workforce-related termination benefits	1,640	10,185	(5,886)	5,939
Total restructuring liabilities	$ 2,073	$ 10,210	$ (6,344)	$ 5,939

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Accrued restructuring costs of $0.7 million as of September 30, 2018 are expected to be paid during fiscal year 2019.

18. Earnings per Share

The calculations of basic and diluted net income (loss) per share and basic and diluted weighted average shares outstanding are as follows for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands, except per share data):

	Year Ended September 30,		
	2018	2017	2016
Income (loss) income from continuing operations	$ 67,717	$ 10,687	$ (85,457)
Income from discontinued operations, net of tax	48,747	51,925	15,981
Net income	116,464	62,612	(69,476)
Net loss attributable to noncontrolling interest	111	—	—
Net income (loss) attributable to Brooks Automation, Inc.	$ 116,575	$ 62,612	$ (69,476)
Weighted average common shares outstanding used in computing basic earnings per share	70,489	69,575	68,507
Dilutive restricted stock units	448	910	—
Weighted average common shares outstanding used in computing diluted earnings per share	70,937	70,485	68,507
Basic net income (loss) per share attributable to Brooks Automation, Inc. common stockholders:			
Income (loss) from continuing operations	$ 0.96	$ 0.15	$ (1.25)
Income from discontinued operations, net of tax	0.69	0.75	0.23
Basic net income (loss) per share attributable to Brooks Automation, Inc.	$ 1.65	$ 0.90	$ (1.01)
Diluted net income (loss) per share attributable to Brooks Automation, Inc. common stockholders:			
Income (loss) from continuing operations	$ 0.95	$ 0.15	$ (1.25)
Income from discontinued operations, net of tax	0.69	0.74	0.23
Diluted net income (loss) per share attributable to Brooks Automation, Inc. common stockholders	$ 1.64	$ 0.89	$ (1.01)

Restricted stock units of 9,927 and 9,500, respectively during fiscal year 2018 and 2017 were excluded from the computation of diluted earnings per share as their effect would be anti-dilutive based on the treasury stock method. Restricted stock units of 859,000 during fiscal year 2016 were excluded from the computation of diluted earnings per share as a result of a net loss incurred during the period.

19. Significant Customers

No customers accounted for more than 10% of the Company’s consolidated revenue during the fiscal years ended September 30, 2018, 2017 and 2016. No customers accounted for more than 10% of the Company’s total receivables during the fiscal year ended September 30, 2018 and 2017.

20. Segment and Geographic Information

Operating segments are defined as components of an enterprise that engage in business activities for which discrete financial information is available and regularly reviewed by the chief operating decision maker in deciding how to allocate resources and to assess performance. The Company’s Chief Executive Officer is the Company’s chief operating decision maker.

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The Company has two operating and reportable segments consisting of Brooks Semiconductor Solutions Group segment and Brooks Life Sciences 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, and contamination control of wafer carrier front opening unified pods. 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 for life science and bioscience customers 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 and support services provided to a wide range of life science customers, including pharmaceutical companies, biotechnology companies, biobanks and research institutes.

The Company evaluates the performance and future opportunities of its segments and allocates resources to them based on their revenue, operating income (loss) and returns on invested assets. Operating income (loss) for each segment includes selling, general and administrative expenses directly attributable to the segment. 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' operating income (loss). The Company's indirect overhead costs, which include various general and administrative expenses, are allocated among the segments based upon several cost drivers associated with the respective administrative function, including segment revenue, headcount, or benefits that each segment derives from a specific administrative function. Segment assets exclude cash, cash equivalents, marketable securities, deferred tax assets, assets held for sale and equity method investments.

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The following is the summary of the financial information for the Company's operating and reportable segments for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	Brooks Semiconductor Solutions Group	Brooks Life Sciences	Total
Fiscal Year Ended September 30, 2018			
Revenue			
Products	$ 390,087	$ 92,302	$ 482,389
Services	44,931	104,240	149,171
Segment revenue	$ 435,018	$ 196,542	$ 631,560
Gross profit	$ 173,954	$ 72,127	$ 246,081
Segment operating income	58,373	1,160	59,533
Depreciation expense	3,869	7,433	11,302
Fiscal Year Ended September 30, 2017			
Revenue			
Products	$ 340,233	$ 66,753	$ 406,986
Services	38,557	81,956	120,513
Segment revenue	$ 378,790	$ 148,709	$ 527,499
Gross profit	$ 144,119	$ 54,768	$ 198,887
Segment operating income	40,110	1,410	41,520
Depreciation expense	4,592	4,694	9,286
Fiscal Year Ended September 30, 2016			
Revenue			
Products	$ 289,377	$ 46,546	$ 335,923
Services	36,522	61,567	98,089
Segment revenue	$ 325,899	$ 108,113	$ 434,012
Gross profit	$ 117,626	$ 39,063	$ 156,689
Segment operating income (loss)	16,634	(6,451)	10,183
Depreciation expense	5,158	3,496	8,654
Assets:			
September 30, 2018	$ 264,452	$ 410,581	$ 675,033
September 30, 2017	236,755	306,666	543,421

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 Consolidated Balance Sheets and Consolidated Statements of Operations for the fiscal years ended September 30, 2018, 2017 and 2016 (in thousands):

	For the Year Ended September 30,		
	2018	2017	2016
Segment operating income	$ 59,533	$ 41,520	$ 10,183
Amortization of acquired intangible assets	19,339	13,228	10,799

Restructuring charges	714	3,144	10,210
Other unallocated corporate expenses	8,071	10,829	6,228
Total operating income	$ 31,409	$ 14,319	$ (17,054)

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	September 30, 2018	September 30, 2017
Segment assets	$ 675,033	$ 543,421
Cash, cash equivalents and marketable securities	251,226	104,292
Deferred tax assets	43,798	1,692
Assets held for sale	125,200	117,223
Total assets	$ 1,095,257	$ 766,628

Revenue from external customers is attributed to geographic areas based on locations in which customer orders are placed. Net revenue by geographic area for the fiscal years ended September 30, 2018, 2017 and 2016 are as follows (in thousands):

	Year Ended September 30,		
	2018	2017	2016
North America	$ 233,243	$ 174,432	$ 157,426
Asia / Pacific/ Other	262,706	255,825	196,117
Europe:			
United Kingdom	51,690	37,283	31,342
Rest of Europe	83,921	59,959	49,127
	$ 631,560	$ 527,499	$ 434,012

The majority of the Company’s net revenue in North America is generated in the United States which amounted to $232.7 million, $172.9 million and $156.9 million, respectively, during fiscal years ended September 30, 2018, 2017 and 2016.

The geographic location of an OEM is not indicative of where the products will eventually be used. The geographic area for the orders is determined by the onward sale of an OEM system which incorporates the sub-systems and/or components.

Property, plant and equipment by geographic area as of September 30, 2018 and 2017 are as follows (in thousands):

	September 30,	
	2018	2017
North America	$ 50,614	$ 50,908
Asia / Pacific/ Other	492	547
Europe:		
United Kingdom	5,494	2,848
Rest of Europe	3,388	2,678
	$ 59,988	$ 56,981

Property, plant and equipment located in the United States amounted to $50.5 million and $50.7 million, respectively, at September 30, 2018 and 2017.

21. Fair Value Measurements

The fair value measurement guidance establishes a fair value hierarchy which 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.

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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.

The Company measures certain assets, including the cost and equity method investments, at fair value on a nonrecurring basis when they are deemed to be other-than-temporarily impaired. The fair values of these investments are determined based on valuation techniques using the best information available, and may include quoted market prices, market comparables, and discounted cash flow projections. An impairment charge is recorded when the cost of the investment exceeds its fair value and this condition is determined to be other-than-temporary.

Financial Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following tables summarize assets and liabilities measured and recorded at fair value on a recurring basis in the accompanying Consolidated Balance Sheets as of September 30, 2018 and 2017 (in thousands):

		Fair Value Measurements at Reporting Date Using		
Description	September 30, 2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents	$ 50,572	$ 50,572	$ —	$ —
Available-for-sale securities	53,518	—	53,518	—
Foreign exchange contracts	170	—	170	—
Total Assets	$ 104,260	$ 50,572	$ 53,688	$ —
Liabilities:				
Foreign exchange contracts	177	—	177	—
Term loan	196,071	—	196,071	—
Total Liabilities	$ 196,248	$ —	$ 196,248	$ —

		Fair Value Measurements at Reporting Date Using		
Description	September 30, 2017	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents	$ 45	$ 42	$ 3	$ —
Available-for-sale securities	2,670	—	2,670	—
Foreign exchange contracts	4	—	4	—
Total Assets	$ 2,719	$ 42	$ 2,677	$ —
Liabilities:				
Foreign exchange contracts	146	—	146	—
Total Liabilities	$ 146	$ —	$ 146	$ —

Cash Equivalents

Cash equivalents of $50.6 million and less than $0.1 million, respectively, at September 30, 2018 and 2017 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 as of September 30, 2017 consist primarily of Bank Certificate of Deposits and are classified within Level 2 of the fair value hierarchy because they are not actively traded.

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Available-For-Sale Securities

Available-for-sale securities of $53.5 million and $2.7 million, respectively, at September 30, 2018 and 2017 consist of U.S. Treasury Securities, Municipal Securities, Bank Certificate of Deposits, U.S Corporate Securities and Other Debt Securities. 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.

Foreign Exchange Contracts

Foreign exchange contract assets and liabilities amounted to $0.2 million each at September 30, 2018. Foreign exchange contract assets and liabilities amounted to less than $0.1 million and $0.1 million, respectively, at September 30, 2017. 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 due to a lack of an active market for these contracts.

Term Loan

As of September 30, 2018, estimated fair value of the term loan outstanding principal balance 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.

Financial Assets and Liabilities Measured at Fair Value on a Nonrecurring Basis

During fiscal year 2018 and 2017, the Company did not record any material other-than-temporary impairments on financial assets required to be measured at fair value on a nonrecurring basis.

22. Commitments and Contingencies

Operating Leases Commitments

The Company leases manufacturing and office facilities and certain equipment under non-cancelable operating leases with lease expiration dates through 2025. Rent expense under the operating leases, excluding costs recorded as a component of restructuring charges, was $5.3 million, $4.0 million and $4.5 million, respectively, for the fiscal years ended September 30, 2018, 2017 and 2016.

Future minimum lease commitments on non-cancelable operating leases and scheduled sublease payments as of September 30, 2018 are as follows (in thousands):

Year Ended September 30,	Gross Payments	Scheduled Sublease Payments	Net Payments
2019	$ 3,842	9	3,833
2020	2,377	—	2,377
2021	1,545	—	1,545
2022	1,370	—	1,370
2023	1,251	—	1,251
Thereafter	1,847	—	1,847

$ 12,232	$ 9	$ 12,223

Letters of Credit

At September 30, 2018, the Company had $2.2 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 the Company's 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

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expiration date of the particular letter of credit if the Company fails to meet certain contractual requirements. None of these obligations were called during fiscal years ended September 30, 2018, and the Company currently does not anticipate any of these obligations to be called in the near future.

Purchase Commitments

The Company has non-cancelable contracts and purchase orders for inventory of $85.4 million at September 30, 2018.

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.

23. Subsequent Events

Acquisition

On September 26, 2018, the Company entered into a definitive agreement to acquire GENEWIZ, a leading provider of genomic services, based in New Jersey with operations throughout the United States, Asia, and Europe, for $450.0 million in cash, subject to customary adjustments. The Company completed this acquisition on November 15, 2018.

Term Loan Modification

On November 15, 2018, in connection with the Company’s acquisition of GENEWIZ, the Company entered into an amendment of the existing term loan agreement which increased its outstanding principal balance to $546.0 million. The Company used the proceeds from this extended loan to pay a portion of the purchase price for GENEWIZ.

Dividend

On November 6, 2018, the Company’s Board of Directors declared a cash dividend of $0.10 per share payable on December 20, 2018 to common stockholders of record as of December 7, 2018. Dividends are declared at the discretion of the Company’s Board of Directors and depend on the Company’s actual cash flow from operations, its financial condition and capital requirements, as well as 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 9. Changes in and Disagreements with Accountants on Financial Accounting and Financial Disclosure

Not applicable.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we conducted an evaluation of our disclosure controls and procedures, as such term is defined under Rule 13a 15(e) promulgated under the Exchange Act. Disclosure controls and procedures are designed to ensure that information required to be disclosed by us in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported on a timely basis and that such information is accumulated and communicated to management, including the chief executive officer and chief financial officer, as appropriate, to allow timely decisions regarding required disclosure. Based upon this evaluation, our chief executive officer and our chief financial officer concluded that our disclosure controls and procedures were effective as of September 30, 2018, the end of the period covered by this annual report.

Management’s Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rules 13a 15(f) and 15d 15(f) under the Exchange Act, as a process designed by, or under the supervision of our chief executive and chief financial officers and effected by our board of directors, management and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP and includes those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and disposition of our assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that our receipts and expenditures are being made only in accordance with authorization of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risks that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we conducted an assessment of the effectiveness of our internal control over financial reporting as of September 30, 2018. In making this assessment, we used the criteria set forth in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission. Based on our assessment, our management concluded that, as of September 30, 2018, our internal control over financial reporting was effective.

We excluded 4Titude and Tec-Sem from our assessment of internal control over financial reporting as of September 30, 2018 because they were acquired by the Company in a purchase business combination during fiscal year 2018. The total assets and total revenues of 4Titude and Tec-Sem, represent 2.2% and 4.4%, respectively, of the related consolidated financial statement amounts as of and for the year ended September 30, 2018.

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The effectiveness of our internal control over financial reporting as of September 30, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

Changes in Internal Control Over Financial Reporting

There were no changes in internal control over financial reporting during the fiscal fourth quarter ended September 30, 2018, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item 10 is contained in our definitive proxy statement for our 2019 annual meeting of shareholders to be filed by us within 120 days after the close of our fiscal year, or the 2019 Proxy Statement, under the caption "Proposal No. 1 Election of Directors," "Other Matters-Section 16(a) Beneficial Ownership Compliance," "Other Matters-Standards of Conduct," "Other Matters-Stockholder Proposals and Recommendations for Directors" and "Corporate Governance" and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item 11 is contained under the caption "Corporate Governance and Director Compensation" and "Executive Officers" in the 2019 Proxy Statement to be filed by us within 120 days after the close of our fiscal year and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this Item 12 is contained under the caption "General Information-Security Ownership of Certain Beneficial Owners" and "Equity Compensation Plan Information" in the 2019 Proxy Statement to be filed by us within 120 days after the close of our fiscal year and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this Item 13 is contained under the caption "Related Party Transactions" and "Corporate Governance and Director Compensation" in the 2019 Proxy Statement to be filed by us within 120 days after the close of our fiscal year and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item 14 is contained under the caption "Independent Auditor Fees and Other Matters" in the 2019 Proxy Statement to be filed by us within 120 days after the close of our fiscal year and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Financial Statements and Financial Statement Schedules
- Consolidated Financial Statements of the Company and the related notes are included under Part II, Item 8, "Financial Statements and Supplementary Data" of this Form 10 K.
- Consolidated Financial Statements of ULVAC Cryogenics, Inc. as of as of June 30, 2018 and 2017 and for each of the periods ended June 30, 2018, 2017 and 2016 and the related notes are filed as Exhibit 99.2 hereto and incorporated herein by reference in this Form 10 K pursuant to Rule 3 09 of Regulation S-X.
- Other financial statement schedules are omitted because of the absence of conditions under which they are required or because the required information is given in the supplementary Consolidated Financial Statements or notes thereto.

(b) Exhibits

Exhibit No.	Description
3.01	Restated Certificate of Incorporation of the Company (incorporated herein by reference to Exhibit 3.01 to the Company's registration statement on Form S 3 (Reg. No. 333 189582), filed on June 25, 2013).
3.02	Amended and Restated Bylaws (incorporated herein by reference to Exhibit 3.01 of the Company's current report on Form 8 K, filed on February 11, 2008).
3.03	Amendment to Amended and Restated Bylaws of the Company, dated August 1, 2017 (incorporated herein by reference to Exhibit 3.02 of the Company's quarterly report on Form 10-Q, filed on August 4, 2017
4.01	Specimen Certificate for shares of the Company's common stock (incorporated herein by reference to the Company's registration statement on Form S 3 (Reg. No. 333 88320), filed on May 15, 2002).
10.01	Basic agreement between the Company and Ulvac Corporation dated August 17, 1981 (incorporated herein by reference to Exhibit 10.13 of the registration statement on Form S 2 (Reg. No. 2 84880) filed by Helix Technology Corporation).
10.02	Form of Indemnification Agreement for directors and officers of the Company (incorporated herein by reference to Exhibit 10.02 of the Company's annual report on Form 10-K, filed on November 17, 2017).
10.03	Employment Agreement, effective as of April 5, 2010, by and between Brooks Automation, Inc. and Stephen S. Schwartz (incorporated herein by reference to Exhibit 10.01 to the Company's quarterly report on Form 10 Q for the fiscal quarter ended March 31, 2010, filed on May 6, 2010).
10.04	Offer letter dated September 5, 2013 between the Company and Lindon G. Robertson (incorporated herein by reference to Exhibit 10.11 to the Company's 2013 10 K, filed on November 22, 2013).
10.05	Letter Agreement dated June 4, 2015 between Brooks Automation, Inc. and Lindon G. Robertson (incorporated herein by reference to Exhibit 10.4 to the Company's current report on Form 8 K, filed on June 9, 2015).

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10.06 Offer Letter dated September 27, 2014, as revised, between the Company and Maurice Tenney, III (incorporated herein by reference to Exhibit 10.01 to the Company's quarterly report on Form 10 Q for the quarter ended December 31, 2015, filed on February 3, 2016).

10.07 Amended Offer Letter dated June 4, 2015, between the Company and Maurice Tenney, III (incorporated herein by reference to Exhibit 10.02 to the Company's quarterly report on Form 10 Q for the quarter ended December 31, 2015, filed on February 3, 2016).

10.08 Offer Letter dated June 12, 2014 between the Company and David C. Gray (incorporated herein by reference to Exhibit 10.1 to the Company's quarterly report on Form 10 Q for the quarter ended December 31, 2014, filed on February 5, 2015).

10.09 Letter Agreement dated November 1, 2016 between the Company and David E. Jarzynka (incorporated herein by reference to Exhibit 10.1 to the Company's quarterly report on Form 10-Q for the quarter ended June 30, 2017).

10.10 Form of Non-Competition Agreement (incorporated herein by reference to Exhibit 10.1 to the Company's current report on Form 8 K, filed on June 9, 2015).

10.11 Form of Change in Control Agreement (incorporated herein by reference to Exhibit 10.2 to the Company's current report on Form 8 K, filed on June 9, 2015).

10.12 Second Amended and Restated 2000 Equity Incentive Plan, restated as of May 7, 2013 (incorporated herein by reference to Exhibit 10.01 to the Company's current report on Form 8-K, filed on May 9, 2013).

10.13 2017 Employee Stock Purchase Plan (incorporated herein by reference to Exhibit 10.1 to the Company's current report on Form 8-K, filed on February 13, 2017).

10.14 2015 Equity Incentive Plan (incorporated herein by reference to Exhibit 10.1 to the Company's current report on Form 8 K, filed on February 5, 2015).

10.15 Form of Restricted Stock Unit Award Notice under the 2000 Equity Incentive Plan (incorporated herein by reference to Exhibit 10.18 to the Company's annual report on Form 10 K for the fiscal year ended September 30, 2011, as filed on November 28, 2011 (the "2011 10 K")).

10.16 Form of Restricted Stock Unit Award Notice under the 2015 Equity Incentive Plan (incorporated herein by reference to Exhibit 10.17 of the Company's annual report on Form 10-K, filed on November 17, 2017).

10.17 Executive Performance-Based Variable Compensation Plan (incorporated herein by reference to Exhibit 10.01 to the Company's current report on Form 8 K, filed on January 29, 2016).

10.18 Non-Employee Directors Stock Grant/Restricted Stock Unit Election Form under the 2000 Equity Incentive Plan (incorporated herein by reference to Exhibit 10.42 to the 2010 10-K).

10.19 Non-Employee Director Restricted Stock Unit Deferral Election Form under the 2015 Equity Incentive Plan (incorporated herein by reference to Exhibit 10.20 of the Company's annual report on Form 10-K, filed on November 17, 2017).

10.20

Brooks Automation, Inc. Amended and Restated Deferred Compensation Plan, as amended (incorporated herein by reference to Exhibit 10.21 of the Company's annual report on Form 10-K, filed on November 17, 2017).

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10.21	Credit Agreement by and among Brooks Automation, Inc., BioStorage Technologies, Inc., Wells Fargo Bank, National Association and the Lenders parties thereto (incorporated herein by reference to Exhibit 10.2 to the Company's quarterly report on Form 10 Q for the quarter ended June 30, 2016 filed on July 28, 2016).
10.22	Guaranty and Security Agreement by and among Wells Fargo Bank, National Association and the Grantors and members of the Lender Group parties thereto (incorporated herein by reference to Exhibit 10.3 to the Company's quarterly report on Form 10 Q for the quarter ended June 30, 2016 filed on July 28, 2016).
10.23	Consent and First Amendment to Credit Agreement, dated October 4, 2017, by and among Wells Fargo Bank, National Association, as Administrative Agent, Brooks Automation, Inc. and BioStorage Technologies Inc. (incorporated herein by reference to Exhibit 10.24 of the Company's annual report on Form 10-K, filed on November 17, 2017).
10.24	Credit Agreement dated October 4, 2017 by and among Brooks Automation, Inc., Morgan Stanley Senior Funding, Inc., and the lenders party thereto (incorporated herein by reference to Exhibit 10.25 of the Company's annual report on Form 10-K, filed on November 17, 2017).
10.25	Guarantee and Security Agreement dated October 4, 2017 by and among Brooks Automation, Inc., BioStorage Technologies, Inc., Morgan Stanley Senior Funding, Inc., as Administrative Agent for the lenders (incorporated herein by reference to Exhibit 10.26 of the Company's annual report on Form 10-K, filed on November 17, 2017).
10.26	Sales and Purchase Agreement dated October 5, 2017 by and among Brooks Automation Limited and the shareholders of 4titude Ltd (incorporated herein by reference to Exhibit 10.27 of the Company's annual report on Form 10-K, filed on November 17, 2017).
10.27	Agreement of Merger, dated as of September 26, 2018, by and among Brooks Automation, Inc., GENEWIZ Group, Darwin Acquisition Company, and Shareholder Representative Services L.L.C. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed on November 15, 2018).
10.28	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.
10.29	Asset Purchase Agreement dated August 27, 2018 among Brooks Automation, Inc., Edwards Vacuum LLC, and for certain sections thereof, Atlas Copco AB.
21.01	Subsidiaries of the Company.
23.01	Consent of PricewaterhouseCoopers LLP
23.02	Consent of PricewaterhouseCoopers Aarata LLC
31.01	Certification of the Company's Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.02	Certification of the Company's Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

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32	Certification of the Company’s Principal Executive Officer and Principal Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
99.1	Report of Independent Auditors of ULVAC Cryogenics, Inc.
99.2	Consolidated Financial Statements of ULVAC Cryogenics, Inc. as of June 30, 2018 and 2017 and for each of the periods ended June 30, 2018, 2017 and 2016.
101	The following material from the Company’s Annual Report on Form 10 K, for the year ended September 30, 2018, formatted in XBRL (Xtensible Business Reporting Language): (i) the Consolidated Balance Sheets; (ii) the Consolidated Statements of Operations; (iii) the Consolidated Statements of Comprehensive Income (Loss); (iv) the Consolidated Statements of Cash Flows; (v) the Consolidated Statements of Changes in Equity; and (vi) the Notes to Consolidated Financial Statements.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) 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.

By: /S/ STEPHEN S. SCHWARTZ
Stephen S. Schwartz
Chief Executive Officer

Date: November 29, 2018

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/S/ STEPHEN S. SCHWARTZ Stephen S. Schwartz	Director and Chief Executive Officer (Principal Executive Officer)	November 29, 2018
/S/ LINDON G. ROBERTSON Lindon G. Robertson	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	November 29, 2018
/S/ DAVID PIETRANTONI David Pietrantoni	Vice President - Finance and Corporate Controller (Principal Accounting Officer)	November 29, 2018
/S/ A. CLINTON ALLEN A. Clinton Allen	Director	November 29, 2018
/S/ ROBYN C. DAVIS Robyn C. Davis	Director	November 29, 2018
/S/ JOSEPH R. MARTIN Joseph R. Martin	Director	November 29, 2018
/S/ JOHN K. MCGILLICUDDY John K. McGillicuddy	Director	November 29, 2018

/S/ KRISHNA G. PALEPU Krishna G. Palepu	Director	November 29, 2018
/S/ KIRK P. POND Kirk P. Pond	Director	November 29, 2018
/S/ MICHAEL ROSENBLATT Michael Rosenblatt	Director	November 29, 2018

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/S/ ALFRED WOOLLACOTT III Alfred Woollacott III	Director	November 29, 2018
/S/ MARK S. WRIGHTON Mark S. Wrighton	Director	November 29, 2018
/S/ ELLEN M. ZANE Ellen M. Zane	Director	November 29, 2018