UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended June 30, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission file number 0-16244

VEECO INSTRUMENTS INC .

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**11-2989601**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
Terminal Drive **Plainview , New York**	**11803**
(Address of Principal Executive Offices)	(Zip Code)

Registrant's telephone number, including area code:
(516) 677-0200

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.01 per share	**VECO**	**The NASDAQ Global Select Market**

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).Yes ☒ No ☐

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

Large accelerated filer ☒	Accelerated filer ☐
Non-accelerated filer ☐	Smaller reporting company ☐
	Emerging growth company ☐

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

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

As of July 25, 2019, there were 48,971,367 shares of the registrant's common stock outstanding.

VEECO INSTRUMENTS INC.

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Safe Harbor Statement

This quarterly report on Form 10-Q (the "Report") contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Discussions containing such forward-looking statements may be found in Part I - Items 1, 2, and 3 hereof, as well as within this Report generally. In addition, when used in this Report, the words "believes," "anticipates," "expects," "estimates," "targets," "plans," "intends," "will," and similar expressions related to the future are intended to identify forward-looking statements. All forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from projected results.

In addition, the preparation of financial statements in conformity with U.S. Generally Accepted Accounting Principles ("U.S. GAAP") requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Although these estimates and assumptions are based on knowledge of current events and planned actions to be undertaken in the future, they may ultimately differ from actual results. Operating results for the three and six months ended June 30, 2019 are not necessarily indicative of the results that may be expected for the year ending December 31, 2019. All estimates and assumptions are subject to a number of risks and uncertainties that could cause actual results to differ materially from these estimates and assumptions.

The risks and uncertainties of Veeco Instruments Inc. (together with its consolidated subsidiaries, "Veeco," the "Company," "we," "us," and "our," unless the context indicates otherwise) include, without limitation, those set forth under the heading "Risk Factors" Part 1, Item 1A in our 2018 Form 10-K and Part 2, Item 1A in this quarterly report, and the following:

- Unfavorable market conditions have adversely affected, and may continue to adversely affect, our operating results;
- We are exposed to the risks of operating a global business;
- International trade disputes could result in increases in tariffs and other trade restrictions and protectionist measures that could negatively impact our operations;
- Disruptions in our information technology systems or data security incidents could result in significant financial, legal, regulatory, business, and reputational harm to us;
- We may be unable to effectively enforce and protect our intellectual property rights;
- We may be subject to claims of intellectual property infringement by others;
- The price of our common shares is volatile, has declined significantly, and could further decline;
- We may be required to take additional impairment charges on assets;
- We face significant competition;
- We operate in industries characterized by rapid technological change;
- Our sales to manufacturers are highly dependent on sales of consumer electronics applications, which can experience significant volatility due to seasonal and other factors;
- We have a concentrated customer base, located primarily in a limited number of regions, which operate in highly concentrated industries;
- The cyclicality of the industries we serve directly affects our business;

- The timing of our orders, shipments, and revenue recognition may cause our quarterly operating results to fluctuate significantly;
- Our sales cycle is long and unpredictable;
- Our backlog is subject to customer cancellation or modification which could result in decreased sales, increased inventory obsolescence, and liabilities to our suppliers for products no longer needed;
- We may be unable to obtain required export licenses for the sale of our products;
- Our operating results may be adversely affected by tightening credit markets;
- Our failure to estimate customer demand accurately could result in inventory obsolescence, liabilities to our suppliers for products no longer needed, and manufacturing interruptions or delays which could affect our ability to meet customer demand;
- Our failure to successfully manage our outsourcing activities or failure of our outsourcing partners to perform as anticipated could adversely affect our results of operations;
- We rely on a limited number of suppliers, some of whom are our sole source for particular components;
- Our inability to attract, retain, and motivate employees could have a material adverse effect on our business;
- We are exposed to risks associated with business combinations, acquisitions, and strategic investments;
- We are subject to internal control evaluations and attestation requirements of Section 404 of the Sarbanes-Oxley Act and any delays or difficulties in satisfying these requirements or negative reports concerning our internal controls could adversely affect our future results of operations and our stock price;
- Changes in accounting pronouncements or taxation rules or practices may adversely affect our financial results;
- Our income taxes may change;
- We have indebtedness in the form of convertible senior notes which could adversely affect our financial position, prevent us from implementing our strategy, and dilute the ownership interest of our existing shareholders;
- The accounting method for convertible debt securities that may be settled in cash, such as the Convertible Senior Notes, could have a material effect on our reported financial results;
- We are subject to foreign currency exchange risks;
- Our previously announced share repurchase program could affect the price of our common stock and increase volatility and may be suspended or terminated at any time, which may result in a decrease in the trading price of our common stock;
- We have adopted certain measures that may have anti-takeover effects which may make an acquisition of our Company by another company more difficult;
- We are exposed to various risks associated with global regulatory requirements;

- We may be exposed to liabilities under the Foreign Corrupt Practices Act and other similar laws;
- We are subject to risks of non-compliance with environmental, health, and safety regulations;
- We have significant operations in locations which could be materially and adversely impacted in the event of a natural disaster, an act of terrorism, or other significant disruption; and
- Changes in U.S. trade policy and export controls and ongoing trade disputes between the U.S. and China have adversely affected, and may continue to adversely affect, our business, results of operations, and financial condition.

Consequently, such forward looking statements and estimates should be regarded solely as the current plans and beliefs of Veeco. We do not undertake any obligation to update any forward looking statements to reflect future events or circumstances after the date of such statements.

PART I — FINANCIAL INFORMATION

Item 1. Financial Statements

Veeco Instruments Inc. and Subsidiaries
Consolidated Balance Sheets
(in thousands, except share amounts)

	June 30, 2019 (unaudited)	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$ 161,715	$ 212,273
Restricted cash	733	809
Short-term investments	84,495	48,189
Accounts receivable, net	58,949	66,808
Contract assets	12,029	10,397
Inventories	139,708	156,311
Deferred cost of sales	7,444	3,072
Prepaid expenses and other current assets	26,444	22,221
Total current assets	491,517	520,080
Property, plant, and equipment, net	80,761	80,284
Operating lease right-of-use assets	11,543	—
Intangible assets, net	76,689	85,149
Goodwill	184,302	184,302
Deferred income taxes	1,869	1,869
Other assets	29,182	29,132
Total assets	$ 875,863	$ 900,816
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 21,703	$ 39,611
Accrued expenses and other current liabilities	42,797	46,450
Customer deposits and deferred revenue	84,031	72,736
Income taxes payable	669	1,256
Total current liabilities	149,200	160,053
Deferred income taxes	5,700	5,690
Long-term debt	293,611	287,392
Operating lease long-term liabilities	7,166	—
Other liabilities	9,160	9,906
Total liabilities	464,837	463,041
Stockholders' equity:		
Preferred stock, $0.01 par value; 500,000 shares authorized; no shares issued and outstanding.	—	—
Common stock, $0.01 par value; 120,000,000 shares authorized; 48,971,017 and 48,547,417 shares issued at June 30, 2019 and December 31, 2018, respectively; 48,971,017 and 48,024,685 shares outstanding at June 30, 2019 and December 31, 2018, respectively.	490	485
Additional paid-in capital	1,062,949	1,061,325
Accumulated deficit	(654,291)	(619,983)
Accumulated other comprehensive income	1,878	1,820
Treasury stock, at cost, 522,732 shares at December 31, 2018.	—	(5,872)
Total stockholders' equity	411,026	437,775
Total liabilities and stockholders' equity	$ 875,863	$ 900,816

See accompanying Notes to the Consolidated Financial Statements .

Veeco Instruments Inc. and Subsidiaries
Consolidated Statements of Operations
(in thousands, except per share amounts)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Net sales	$ 97,822	$ 157,779	$ 197,193	$ 316,353
Cost of sales	61,537	102,384	126,192	204,278
Gross profit	36,285	55,395	71,001	112,075
Operating expenses, net:				
Research and development	22,922	24,930	46,262	49,250
Selling, general, and administrative	19,757	24,274	39,660	50,657
Amortization of intangible assets	4,243	10,386	8,460	23,918
Restructuring	616	2,917	2,046	5,612
Acquisition costs	—	1,316	—	2,657
Asset impairment	—	252,343	—	252,343
Other, net	(44)	443	(80)	286
Total operating expenses, net	47,494	316,609	96,348	384,723
Operating income (loss)	(11,209)	(261,214)	(25,347)	(272,648)
Interest income	1,284	819	2,529	1,443
Interest expense	(5,495)	(5,264)	(10,941)	(10,511)
Income (loss) before income taxes	(15,420)	(265,659)	(33,759)	(281,716)
Income tax expense (benefit)	145	(28,025)	336	(28,255)
Net income (loss)	$ (15,565)	$ (237,634)	$ (34,095)	$ (253,461)
Income (loss) per common share:				
Basic	$ (0.33)	$ (5.02)	$ (0.72)	$ (5.35)
Diluted	$ (0.33)	$ (5.02)	$ (0.72)	$ (5.35)
Weighted average number of shares:				
Basic	47,112	47,311	47,145	47,332
Diluted	47,112	47,311	47,145	47,332

See accompanying Notes to the Consolidated Financial Statements .

Veeco Instruments Inc. and Subsidiaries
Consolidated Statements of Comprehensive Income (Loss)
(in thousands)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Net income (loss)	$ (15,565)	$ (237,634)	$ (34,095)	$ (253,461)
Other comprehensive income (loss), net of tax:				
Unrealized gain (loss) on available-for-sale securities	18	8	45	—
Foreign currency translation	2	(32)	13	—
Total other comprehensive income (loss), net of tax	20	(24)	58	—
Total comprehensive income (loss)	$ (15,545)	$ (237,658)	$ (34,037)	$ (253,461)

See accompanying Notes to the Consolidated Financial Statements .

Veeco Instruments Inc. and Subsidiaries
Consolidated Statements of Cash Flows
(in thousands)
(unaudited)

	Six months ended June 30, 2019	Six months ended June 30, 2018
Cash Flows from Operating Activities		
Net income (loss)	$ (34,095)	$ (253,461)
Adjustments to reconcile net income (loss) to net cash provided by (used in) operating activities:		
Depreciation and amortization	17,315	32,306
Non-cash interest expense	6,219	5,771
Deferred income taxes	10	(27,658)
Share-based compensation expense	7,745	9,441
Asset impairment	—	252,343
Changes in operating assets and liabilities:		
Accounts receivable and contract assets	6,227	(39,655)
Inventories and deferred cost of sales	8,534	(9,890)
Prepaid expenses and other current assets	(3,957)	4,868
Accounts payable and accrued expenses	(25,955)	11,761
Customer deposits and deferred revenue	11,294	(38,573)
Income taxes receivable and payable, net	(587)	(4,189)
Other, net	(891)	(504)
Net cash provided by (used in) operating activities	(8,141)	(57,440)
Cash Flows from Investing Activities		
Capital expenditures	(6,441)	(3,796)
Proceeds from the sale of investments	40,500	45,365
Payments for purchases of investments	(76,108)	(65,400)
Net cash provided by (used in) investing activities	(42,049)	(23,831)
Cash Flows from Financing Activities		
Cash withholdings for employee stock purchase plan	1,784	2,039
Restricted stock tax withholdings	(2,241)	(2,859)
Purchases of common stock	—	(1,225)
Net cash provided by (used in) financing activities	(457)	(2,045)
Effect of exchange rate changes on cash and cash equivalents	13	—
Net increase (decrease) in cash, cash equivalents, and restricted cash	(50,634)	(83,316)
Cash, cash equivalents, and restricted cash - beginning of period	213,082	280,583
Cash, cash equivalents, and restricted cash - end of period	$ 162,448	$ 197,267
Supplemental Disclosure of Cash Flow Information		
Interest paid	$ 4,721	$ 4,692
Income taxes paid	2,618	3,563
Non-cash operating and financing activities		
Net transfer of inventory to property, plant and equipment	3,695	6
Right-of-use assets obtained in exchange for lease obligations	339	—

See accompanying Notes to the Consolidated Financial Statements .

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements
(unaudited)

Note 1 — Basis of Presentation

The accompanying unaudited Consolidated Financial Statements of Veeco have been prepared in accordance with U.S. GAAP as defined in Financial Accounting Standards Board ("FASB") Accounting Standards Codification 270 for interim financial information and with the instructions to Rule 10-01 of Securities and Exchange Commission Regulation S-X. Accordingly, they do not include all of the information and footnotes required by U.S. GAAP for complete financial statements as the interim information is an update of the information that was presented in Veeco's most recent annual financial statements. For further information, refer to Veeco's Consolidated Financial Statements and Notes thereto included in the Annual Report on Form 10-K for the year ended December 31, 2018 ("2018 Form 10-K"). In the opinion of management, all adjustments considered necessary for a fair presentation have been included. All such adjustments are of a normal, recurring nature.

Veeco reports interim quarters on a 13-week basis ending on the last Sunday of each quarter. The fourth quarter always ends on the last day of the calendar year, December 31. The 2019 interim quarters end on March 31, June 30, and September 29, and the 2018 interim quarters ended on April 1, July 1, and September 30. These interim quarters are reported as March 31, June 30, and September 30 in Veeco's interim consolidated financial statements.

Revenue Recognition

Revenue is recognized upon the transfer of control of the promised product or service to the customer in an amount that reflects the consideration the Company expects to receive in exchange for such product or service. The Company's contracts with customers generally do not contain variable consideration. In the rare instances where variable consideration is included, the Company estimates the amount of variable consideration and determines what portion of that, if any, has a high probability of significant subsequent revenue reversal, and if so, that amount is excluded from the transaction price. The Company's contracts with customers frequently contain multiple deliverables, such as systems, upgrades, components, spare parts, installation, maintenance, and service plans. Judgment is required to properly identify the performance obligations within a contract and to determine how the revenue should be allocated among the performance obligations. The Company also evaluates whether multiple transactions with the same customer or related parties should be considered part of a single contract based on an assessment of whether the contracts or agreements are negotiated or executed within a short time frame of each other or if there are indicators that the contracts are negotiated in contemplation of one another.

When there are separate units of accounting, the Company allocates revenue to each performance obligation on a relative stand-alone selling price basis. The stand-alone selling prices are determined based on the prices at which the Company separately sells the systems, upgrades, components, spare parts, installation, maintenance, and service plans. For items that are not sold separately, the Company estimates stand-alone selling prices generally using an expected cost plus margin approach.

Most of the Company's revenue is recognized at a point in time when the performance obligation is satisfied. The Company considers many facts when evaluating each of its sales arrangements to determine the timing of revenue recognition, including its contractual obligations and the nature of the customer's post-delivery acceptance provisions. The Company's system sales arrangements, including certain upgrades, generally include field acceptance provisions that may include functional or mechanical test procedures. For many of these arrangements, a customer source inspection of the system is performed in the Company's facility, test data is sent to the customer documenting that the system is functioning to the agreed upon specifications prior to delivery, or other quality assurance testing is performed internally to ensure system functionality prior to shipment. Historically, such source inspection or test data replicates the field acceptance provisions that are performed at the customer's site prior to final acceptance of the system. When the Company objectively demonstrates that the criteria specified in the contractual acceptance provisions are achieved prior to delivery either through customer testing or the Company's historical experience of its tools meeting specifications, transfer of control of the product to the customer is considered to have occurred and revenue is recognized upon system

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
(unaudited)

delivery since there is no substantive contingency remaining related to the acceptance provisions at that date. For new products, new applications of existing products, or for products with substantive customer acceptance provisions where the Company cannot objectively demonstrate that the criteria specified in the contractual acceptance provisions have been achieved prior to delivery, revenue and the associated costs are deferred. The Company recognizes such revenue and costs upon obtaining objective evidence that the acceptance provisions can be achieved, assuming all other revenue recognition criteria have been met.

In certain cases the Company’s contracts with customers contain a billing retention, typically 10% of the sales price, which is billed by the Company and payable by the customer when field acceptance provisions are completed. Revenue recognized in advance of the amount that has been billed is recorded as a contract asset on the Consolidated Balance Sheets.

The Company recognizes revenue related to maintenance and service contracts over time based upon the respective contract term. Installation revenue is recognized over time as the installation services are performed. The Company recognizes revenue from the sales of components, spare parts, and specified service engagements at a point in time, which is typically consistent with the time of delivery in accordance with the terms of the applicable sales arrangement.

The Company may receive customer deposits on system transactions. The timing of the transfer of goods or services related to the deposits is either at the discretion of the customer or expected to be within one year from the deposit receipt. As such, the Company does not adjust transaction prices for the time value of money. Incremental direct costs incurred related to the acquisition of a customer contract, such as sales commissions, are expensed as incurred since the expected amortization period is one year or less.

The Company has elected to treat shipping and handling costs as a fulfillment activity, and the Company includes such costs in cost of services when the Company recognizes revenue for the related goods. Taxes assessed by governmental authorities that are collected by the Company from a customer are excluded from revenue.

Leases

At contract inception, the Company determines if an arrangement is a lease, or contains a lease, of an identified asset for which the Company has the right to obtain substantially all of the economic benefits from its use and the right to direct its use. Right-of-use (“ROU”) assets represent the Company’s right to use an underlying asset for the lease term, while lease liabilities represent the Company’s obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at lease commencement date based on the present value of lease payments over the lease term. The implicit discount rate in the Company’s leases generally cannot readily be determined, and therefore the Company uses its incremental borrowing rate based on information available at lease commencement date in determining the present value of future payments. The Company has options to renew or terminate certain leases. These options are included in the determination of lease term when it is reasonably certain that the Company will exercise such options. The Company does not separate lease and non-lease components in determining ROU assets or lease liabilities for real estate leases. Additionally, the Company does not recognize ROU assets or lease liabilities for leases with original terms or renewals of one year or less.

Recently Adopted Accounting Standards

In February 2016, the FASB issued ASU 2016-02: *Leases* , which, along with subsequent ASUs related to this topic, has been codified as Accounting Standards Codification 842 (“ASC 842”). ASC 842 generally requires operating lessee rights and obligations to be recognized as assets and liabilities on the balance sheet. The new standard, which the Company adopted effective January 1, 2019, offers a transition option whereby companies can recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption rather than in the earliest period presented. The Company has adopted using this transition method, and therefore prior period balances have not been

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
(unaudited)

adjusted. In addition, ASC 842 provides for a number of optional exemptions in transition. The Company has elected certain exemptions whereby prior conclusions regarding lease identification, lease classification, and initial direct costs were not reassessed under the new standard. The adoption of the standard impacted the Company's Consolidated Balance Sheets through the recognition of ROU assets and lease liabilities of approximately $14.2 million each as of January 1, 2019, but did not have an impact on the Consolidated Statements of Operations, Statements of Comprehensive Income, or Statements of Cash Flows.

Note 2 — Income (Loss) Per Common Share

Basic income (loss) per share is calculated by dividing net income (loss) by the weighted average number of shares outstanding during the period. Diluted income per share is calculated by dividing net income by the weighted average number of shares used to calculate basic income (loss) per share plus the weighted average number of common share equivalents outstanding during the period. The dilutive effect of outstanding options to purchase common stock and share-based awards is considered in diluted income per share by application of the treasury stock method. The dilutive effect of performance share units is included in diluted income per common share in the periods the performance targets have been achieved. The computations of basic and diluted income (loss) per share for the three and six months ended June 30, 2019 and 2018 are as follows:

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
	(in thousands, except per share amounts)			
Net income (loss)	$ (15,565)	$ (237,634)	$ (34,095)	$ (253,461)
Net income (loss) per common share:				
Basic	$ (0.33)	$ (5.02)	$ (0.72)	$ (5.35)
Diluted	$ (0.33)	$ (5.02)	$ (0.72)	$ (5.35)
Basic weighted average shares outstanding	47,112	47,311	47,145	47,332
Effect of potentially dilutive share-based awards	—	—	—	—
Diluted weighted average shares outstanding	47,112	47,311	47,145	47,332
Common share equivalents excluded from the diluted weighted average shares outstanding since Veeco incurred a net loss and their effect would be antidilutive	498	22	344	23
Potentially dilutive shares excluded from the diluted calculation as their effect would be antidilutive	1,903	2,706	1,933	2,204
Maximum potential shares to be issued for settlement of the Convertible Senior Notes excluded from the diluted calculation as their effect would be antidilutive	8,618	8,618	8,618	8,618

Note 3 — Assets

Investments

Short-term investments are generally classified as available-for-sale and reported at fair value, with unrealized gains and losses, net of tax, presented as a separate component of stockholders' equity under the caption "Accumulated other comprehensive income" in the Consolidated Balance Sheets. These securities may include U.S. treasuries, government agency securities, corporate debt, and commercial paper, all with maturities of greater than three months when purchased. All realized gains and losses and unrealized losses resulting from declines in fair value that are other than temporary are included in "Other, net" in the Consolidated Statements of Operations.

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
(unaudited)

Fair value is the price that would be received for an asset or the amount paid to transfer a liability in an orderly transaction between market participants. Veeco classifies certain assets based on the following fair value hierarchy:

Level 1: Quoted prices in active markets that are unadjusted and accessible at the measurement date for identical, unrestricted assets or liabilities;

Level 2: Quoted prices for identical assets and liabilities in markets that are not active, quoted prices for similar assets and liabilities in active markets or financial instruments for which significant inputs are observable, either directly or indirectly; and

Level 3: Prices or valuations that require inputs that are both significant to the fair value measurement and unobservable.

A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Veeco has evaluated the estimated fair value of financial instruments using available market information and valuations as provided by third-party sources. The use of different market assumptions or estimation methodologies could have a significant effect on the estimated fair value amounts.

The following table presents the portion of Veeco's assets that were measured at fair value on a recurring basis at June 30, 2019 and December 31, 2018:

	Level 1	Level 2	Level 3	Total
		(in thousands)		
June 30, 2019				
Cash equivalents				
Certificate of deposits and time deposits	$ 59,151	$ —	$ —	$ 59,151
U.S. treasuries	29,914	—	—	29,914
Commercial paper	—	17,911	—	17,911
Total	$ 89,065	$ 17,911	$ —	$ 106,976
Short-term investments				
U.S. treasuries	$ 56,905	$ —	$ —	$ 56,905
Government agency securities	—	4,995	—	4,995
Corporate debt	—	1,001	—	1,001
Commercial paper	—	21,594	—	21,594
Total	$ 56,905	$ 27,590	$ —	$ 84,495
December 31, 2018				
Cash equivalents				
Certificate of deposits and time deposits	$ 65,571	$ —	$ —	$ 65,571
U.S. treasuries	3,990	—	—	3,990
Total	$ 69,561	$ —	$ —	$ 69,561
Short-term investments				
U.S. treasuries	$ 37,184	$ —	$ —	$ 37,184
Corporate debt	—	8,516	—	8,516
Commercial paper	—	2,489	—	2,489
Total	$ 37,184	$ 11,005	$ —	$ 48,189

There were no transfers between fair value measurement levels during the three and six months ended June 30, 2019.

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Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
(unaudited)

At June 30, 2019 and December 31, 2018, the amortized cost and fair value of available-for-sale securities consist of:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
		(in thousands)		
June 30, 2019				
U.S. treasuries	$ 56,877	$ 28	$ —	$ 56,905
Government agency securities	4,995	—	—	4,995
Corporate debt	1,001	—	—	1,001
Commercial paper	21,593	1	—	21,594
Total	$ 84,466	$ 29	$ —	$ 84,495
December 31, 2018				
U.S. treasuries	$ 37,191	$ —	$ (7)	$ 37,184
Corporate debt	8,525	—	(9)	8,516
Commercial paper	2,489	—	—	2,489
Total	$ 48,205	$ —	$ (16)	$ 48,189

There were no available-for-sale securities in a loss position at June 30, 2019. Available-for-sale securities in a loss position at December 31, 2018 consist of:

	December 31, 2018	
	Estimated Fair Value	Gross Unrealized Losses
	(in thousands)	
U.S. treasuries	$ 37,184	$ (7)
Corporate debt	8,516	(9)
Total	$ 45,700	$ (16)

At June 30, 2019 and December 31, 2018, there were no short-term investments that had been in a continuous loss position for more than 12 months.

The maturities of securities classified as available-for-sale at June 30, 2019 were all due in one year or less. Actual maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment penalties. There were no realized gains or losses for the three and six months ended June 30, 2019 and 2018.

Accounts Receivable

Accounts receivable is presented net of an allowance for doubtful accounts of $0.2 million and $0.3 million at June 30, 2019 and December 31, 2018, respectively.

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
(unaudited)

Inventories

Inventories are stated at the lower of cost or net realizable value, with cost determined on a first-in, first-out basis. Inventories at June 30, 2019 and December 31, 2018 consist of the following:

	June 30, 2019	December 31, 2018
	(in thousands)	
Materials	$ 85,721	$ 90,816
Work-in-process	36,236	42,354
Finished goods	17,751	23,141
Total	$ 139,708	$ 156,311

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets primarily consist of supplier deposits, prepaid value-added tax, lease deposits, prepaid insurance, and prepaid licenses. Veeco had deposits with its suppliers of $15.8 million and $12.8 million at June 30, 2019 and December 31, 2018, respectively.

Property, Plant, and Equipment

Property, plant, and equipment at June 30, 2019 and December 31, 2018 consist of the following:

	June 30, 2019	December 31, 2018
	(in thousands)	
Land	$ 5,669	$ 5,669
Building and improvements	61,407	61,124
Machinery and equipment (1)	136,930	128,385
Leasehold improvements	6,792	9,033
Gross property, plant, and equipment	210,798	204,211
Less: accumulated depreciation and amortization	130,037	123,927
Net property, plant, and equipment	$ 80,761	$ 80,284

(1) Machinery and equipment also includes software, furniture and fixtures

For the three and six months ended June 30, 2019, depreciation expense was $4.3 million and $8.9 million, respectively, and $4.2 million and $8.4 million for the comparable 2018 periods.

Goodwill

Goodwill represents the future economic benefits arising from assets acquired in a business combination that are not individually identified and separately recognized. There were no changes to goodwill during the six months ended June 30, 2019.

Intangible Assets

Intangible assets consist of purchased technology, customer relationships, patents, trademarks and tradenames, and backlog, and are initially recorded at fair value. Long-lived intangible assets are amortized over their estimated useful lives in a method reflecting the pattern in which the economic benefits are consumed or amortized on a straight-line basis if such pattern cannot be reliably determined.

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
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The components of purchased intangible assets were as follows:

	June 30, 2019			December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization and Impairment	Net Amount	Gross Carrying Amount	Accumulated Amortization and Impairment	Net Amount
	(in thousands)					
Technology	$ 350,928	$ 306,817	$ 44,111	$ 337,218	$ 290,808	$ 46,410
Customer relationships	164,595	138,387	26,208	164,595	136,126	28,469
In-process R&D	—	—	—	13,710	10,530	3,180
Trademarks and tradenames	30,910	24,577	6,333	30,910	23,899	7,011
Other	3,686	3,649	37	3,686	3,607	79
Total	$ 550,119	$ 473,430	$ 76,689	$ 550,119	$ 464,970	$ 85,149

Other intangible assets primarily consist of patents, licenses, and backlog.

Other Assets

The Company has a non-marketable investment in Kateeva, Inc. ("Kateeva"), with a carrying value of $21.0 million at June 30, 2019 and December 31, 2018. Additionally, the Company has a non-marketable investment in a separate entity, with a carrying value of $3.5 million at June 30, 2019 and December 31, 2018. The Company does not exert significant influence over these investments, and its ownership interest is less than 20%. Neither equity investment has a readily observable market price, and therefore the Company has elected to measure these investments at cost, adjusted for changes in observable market prices minus impairment. The investments are included in "Other assets" on the Consolidated Balance Sheets. There were no changes in observable market prices for either investment for the six months ended June 30, 2019. These investments are subject to periodic impairment reviews; as there are no open-market valuations, the impairment analyses require judgment. The analyses include assessments of the companies' financial condition, the business outlooks for their products and technologies, their projected results and cash flow, business valuation indications from recent rounds of financing, the likelihood of obtaining subsequent rounds of financing, and the impact of equity preferences held by Veeco relative to other investors.

Note 4 — Liabilities

Accrued Expenses and Other Current Liabilities

The components of accrued expenses and other current liabilities at June 30, 2019 and December 31, 2018 consist of:

	June 30, 2019	December 31, 2018
	(in thousands)	
Payroll and related benefits	$ 14,768	$ 20,486
Warranty	7,099	7,852
Operating lease liabilities	4,440	—
Interest	4,321	4,321
Professional fees	2,219	2,897
Sales, use, and other taxes	1,547	2,670
Restructuring liability	1,336	2,213
Other	7,067	6,011
Total	$ 42,797	$ 46,450

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
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Warranty

Warranties are typically valid for one year from the date of system final acceptance, and Veeco estimates the costs that may be incurred under the warranty. Estimated warranty costs are determined by analyzing specific product and historical configuration statistics and regional warranty support costs and are affected by product failure rates, material usage, and labor costs incurred in correcting product failures during the warranty period. Unforeseen component failures or exceptional component performance can also result in changes to warranty costs. Changes in product warranty reserves for the six months ended June 30, 2019 include:

	(in thousands)
Balance - December 31, 2018	$ 7,852
Warranties issued	2,518
Consumption of reserves	(3,350)
Changes in estimate	79
Balance - June 30, 2019	$ 7,099

Restructuring Accruals

During the second quarter of 2018, the Company initiated plans to further reduce excess capacity associated with the manufacture and support of the Company's advanced packaging lithography and 3D wafer inspection systems by consolidating these operations into its San Jose, California facility. As a result of this and other cost saving initiatives, the Company announced headcount reductions of approximately 40 employees. During the six months ended June 30, 2019, additional accruals were recognized and payments were made related to these restructuring initiatives.

The Company continued to record restructuring charges during the three and six months ended June 30, 2019 in an effort to streamline operations, enhance efficiencies, and reduce costs.

	Personnel Severance and Related Costs	Facility Related Costs and Other	Total
		(in thousands)	
Balance - December 31, 2018	$ 2,143	$ 70	$ 2,213
Provision	1,910	136	2,046
Payments	(2,717)	(206)	(2,923)
Balance - June 30, 2019	$ 1,336	$ —	$ 1,336

Customer Deposits and Deferred Revenue

Customer deposits totaled $34.6 million and $28.3 million at June 30, 2019 and December 31, 2018, respectively. Deferred revenue represents amounts billed, other than deposits, in excess of the revenue that can be recognized on a particular contract at the balance sheet date. Changes in deferred revenue were as follows:

	(in thousands)
Balance - December 31, 2018	$ 44,415
Deferral of revenue	12,012
Recognition of previously deferred revenue	(6,977)
Balance - June 30, 2019	$ 49,450

As of June 30, 2019, the Company has approximately $65.1 million of remaining performance obligations on contracts with an original estimated duration of

one year

or more, of which approximately 64% is expected to be recognized within

one year

, with the remaining amounts expected to be recognized between one to three years. The Company has

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
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elected to exclude disclosures regarding remaining performance obligations that have an original expected duration of

one

year or less.

Convertible Senior Notes

On January 10, 2017, the Company issued $345.0 million of 2.70% convertible senior unsecured notes (the “Convertible Senior Notes”). The Company received net proceeds, after deducting underwriting discounts and fees and expenses payable by the Company, of approximately $335.8 million. The Convertible Senior Notes bear interest at a rate of 2.70% per year, payable semiannually in arrears on January 15 and July 15 of each year, commencing on July 15, 2017. The Convertible Senior Notes mature on January 15, 2023 (the “Maturity Date”), unless earlier purchased by the Company, redeemed, or converted.

The carrying value of the Convertible Senior Notes is as follows:

	June 30, 2019	December 31, 2018
	(in thousands)	
Principal amount	$ 345,000	$ 345,000
Unamortized debt discount	(46,686)	(52,336)
Unamortized transaction costs	(4,703)	(5,272)
Net carrying value	$ 293,611	$ 287,392

Total interest expense related to the Convertible Senior Notes is as follows:

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
	(in thousands)			
Cash Interest Expense				
Coupon interest expense	$ 2,329	$ 2,329	$ 4,658	$ 4,658
Non-Cash Interest Expense				
Amortization of debt discount	2,851	2,646	5,650	5,243
Amortization of transaction costs	287	266	569	528
Total Interest Expense	$ 5,467	$ 5,241	$ 10,877	$ 10,429

The Company determined the Convertible Senior Notes is a Level 2 liability in the fair value hierarchy and estimated its fair value as $305.3 million at June 30, 2019.

Other Liabilities

As part of the acquisition of Ultratech, the Company assumed an executive non-qualified deferred compensation plan that allowed qualifying executives to defer cash compensation. The plan was frozen at the time of acquisition and no further contributions have been made. At June 30, 2019 and December 31, 2018, plan assets approximated $3.5 million and $3.2 million, respectively, representing the cash surrender value of life insurance policies and is included within “Other assets” in the Consolidated Balance Sheets, while plan liabilities approximated $3.0 million and $3.5 million, respectively, and is included within “Other liabilities” in the Consolidated Balance Sheets. Other liabilities also included medical and dental benefits of $2.0 million and $2.2 million at June 30, 2019 and December 31, 2018, respectively, and asset retirement obligations of $3.2 million and income tax payables of $1.0 million at both June 30, 2019 and December 31, 2018.

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
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Note 5 — Commitments and Contingencies

Leases

The Company’s operating leases primarily include real estate leases for properties used for manufacturing, R&D activities, sales and service, and administration, as well as certain equipment leases. Some leases may include options to renew for a period of up to 5 years, while others may include options to terminate the lease. The weighted average remaining lease term of the Company’s operating leases as of June 30, 2019 was 3 years, and the weighted average discount rate used in determining the present value of future lease payments was 6.0%.

Minimum lease commitments at June 30, 2019 for property and equipment under operating lease agreements are payable as follows:

	Operating Leases
	(in thousands)
Payments due by period:	
2019	$ 2,450
2020	5,119
2021	2,439
2022	1,356
2023	865
Thereafter	551
Total future minimum lease payments	12,780
Less: Imputed interest	(1,174)
Total	11,606
Reported as of June 30, 2019	
Other current liabilities	4,440
Operating lease liabilities	7,166
Total	$ 11,606

Minimum lease commitments at December 31, 2018 for property and equipment under operating lease agreements were payable as follows:

	Operating Leases
	(in thousands)
Payments due by period:	
2019	$ 5,143
2020	5,056
2021	2,432
2022	1,812
2023	1,066
Thereafter	548
Total	$ 16,057

Operating lease cost for the three and six months ended June 30, 2019 were $1.4 million and $2.8 million, respectively. Variable lease cost for the three and six months ended June 30, 2019 were $0.4 million and $1.0 million, respectively. Additionally, the Company has an immaterial amount of short term leases. Lease expense for the three and six months

Veeco Instruments Inc. and Subsidiaries
Notes to the Consolidated Financial Statements - continued
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ended June 30, 2018 was $1.8 million and $3.8 million, respectively. Operating cash outflows from operating leases for the six months ended June 30, 2019 was $3.7 million.

Purchase Commitments

Veeco has purchase commitments of $84.5 million at June 30, 2019, substantially all of which become due within one year.

Bank Guarantees

Veeco has bank guarantees and letters of credit issued by a financial institution on its behalf as needed. At June 30, 2019, outstanding bank guarantees and letters of credit totaled $7.9 million, and unused bank guarantees and letters of credit of $66.9 million were available to be drawn upon.

Legal Proceedings

On June 8, 2018, an Ultratech shareholder who received Veeco stock as part of the consideration for the Ultratech acquisition filed a purported class action complaint in the Superior Court of the State of California, County of Santa Clara, captioned Wolther v. Maheshwari et al., Case No. 18CV329690, on behalf of himself and others who purchased or acquired shares of Veeco pursuant to the registration statement and prospectus which Veeco filed with the SEC in connection with the Ultratech acquisition (the "Wolther Action"). On August 2 and August 8, 2018, two purported class action complaints substantially similar to the Wolther Action were filed on behalf of different plaintiffs in the same court as the Wolther Action. These cases have been consolidated with the Wolther Action, and a consolidated complaint was filed on December 11, 2018. The consolidated complaint seeks to recover damages and fees under Sections 11, 12, and 15 of the Securities Act of 1933 for, among other things, alleged false/misleading statements in the registration statement and prospectus relating to the Ultratech acquisition, relating primarily to the alleged failure to disclose delays in the advanced packaging business, increased MOCVD competition in China, and an intellectual property dispute. Veeco is defending this matter vigorously.

On December 21, 2018, a purported Veeco stockholder filed a derivative action in the Superior Court of the State of California, County of Santa Clara, captioned Vladimir Gusinsky Revocable Trust v. Peeler, et al., Case No. 18CV339925, on behalf of nominal defendant Veeco. The complaint seeks to assert claims for breach of fiduciary duty, waste of corporate assets, and unjust enrichment against current and former Veeco directors premised on purported misstatements and omissions in the registration statement relating to the Ultratech acquisition. The court ordered this action stayed until a future case management conference. Veeco is defending this matter vigorously.

The Company is involved in various other legal proceedings arising in the normal course of business. The Company does not believe that the ultimate resolution of these matters will have a material adverse effect on its consolidated financial position, results of operations, or cash flows.

Note 6 — Derivative Financial Instruments

The Company is exposed to financial market risks arising from changes in currency exchange rates. Changes in currency exchange rates could affect the Company's foreign currency denominated monetary assets and liabilities and forecasted cash flows. The Company enters into monthly forward derivative contracts with the intent of mitigating a portion of this risk. The Company only uses derivative financial instruments in the context of hedging and not for speculative purposes and had not designated its foreign exchange derivatives as hedges. Accordingly, changes in fair value from these contracts are recorded as "Other, net" in the Company's Consolidated Statements of Operations. The Company executes derivative transactions with highly rated financial institutions to mitigate counterparty risk.

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Notes to the Consolidated Financial Statements - continued
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The Company did not have any outstanding derivative contracts at June 30, 2019 or December 31, 2018. Additionally, the Company did not have any gains or losses from currency exchange derivatives during the six months ended June 30, 2019. The following table shows the gains and (losses) from currency exchange derivatives during the three and six months ended June 30, 2018, which are included in “Other, net” in the Consolidated Statements of Operations, as well as the weighted average notional amount of derivatives outstanding for the period:

	Three months ended June 30, 2018		Six months ended June 30, 2018	
	Gains (Losses)	Weighted average notional amount	Gains (Losses)	Weighted average notional amount
	(in thousands)			
Foreign currency exchange forwards	$ 199	$ 5,376	$ 216	$ 2,392

Note 7 — Equity

Statement of Stockholders’ Equity

The following tables present the changes in Stockholders’ Equity:

	Common Stock		Treasury Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Total
	Shares	Amount	Shares	Amount				
					(in thousands)			
Balance at December 31, 2018	48,547	$ 485	523	$ (5,872)	$ 1,061,325	$ (619,983)	$ 1,820	$ 437,775
Net loss	—	—	—	—	—	(18,530)	—	(18,530)
Other comprehensive income, net of tax	—	—	—	—	—	—	38	38
Share-based compensation expense	—	—	—	—	3,157	—	—	3,157
Net issuance under employee stock plans	128	2	(523)	5,872	(6,303)	(213)	—	(642)
Balance at March 31, 2019	48,675	$ 487	—	$ —	$ 1,058,179	$ (638,726)	$ 1,858	$ 421,798
Net loss	—	—	—	—	—	(15,565)	—	(15,565)
Other comprehensive income, net of tax	—	—	—	—	—	—	20	20
Share-based compensation expense	—	—	—	—	4,588	—	—	4,588
Net issuance under employee stock plans	296	3	—	—	182	—	—	185
Balance at June 30, 2019	48,971	$ 490	—	$ —	$ 1,062,949	$ (654,291)	$ 1,878	$ 411,026

	Common Stock		Treasury Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Total
	Shares	Amount	Shares	Amount				
					(in thousands)			
Balance at December 31, 2017	48,229	$ 482	85	$ (1,284)	$ 1,051,953	$ (212,870)	$ 1,812	$ 840,093
Net loss	—	—	—	—	—	(15,827)	—	(15,827)
Other comprehensive income, net of tax	—	—	—	—	—	—	24	24
Share-based compensation expense	—	—	—	—	4,537	—	—	4,537
Net issuance under employee stock plans	462	5	(115)	1,728	(2,159)	—	—	(426)
Purchases of common stock	—	—	30	(444)	—	—	—	(444)
Balance at March 31, 2018	48,691	$ 487	—	$ —	$ 1,054,331	$ (228,697)	$ 1,836	$ 827,957
Net loss	—	—	—	—	—	(237,634)	—	(237,634)
Other comprehensive income, net of tax	—	—	—	—	—	—	(24)	(24)
Share-based compensation expense	—	—	—	—	4,904	—	—	4,904
Net issuance under employee stock plans	43	—	(57)	865	(1,273)	—	—	(408)
Purchases of common stock	—	—	57	(865)	—	—	—	(865)
Balance at June 30, 2018	48,734	$ 487	—	$ —	$ 1,057,962	$ (466,331)	$ 1,812	$ 593,930

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Accumulated Other Comprehensive Income (“AOCI”)

The following table presents the changes in the balances of each component of AOCI, net of tax:

	Foreign Currency Translation	Unrealized Gains (Losses) on Available for Sale Securities	Total
		(in thousands)	
Balance - December 31, 2018	$ 1,836	$ (16)	$ 1,820
Other comprehensive income (loss)	13	45	58
Balance - June 30, 2019	$ 1,849	$ 29	$ 1,878

There were minimal reclassifications from AOCI into net income for the three and six months ended June 30, 2019 and 2018.

Note 8 — Share-based compensation

Restricted share awards are issued to employees that are subject to specified restrictions and a risk of forfeiture. The restrictions typically lapse over one to five years and may entitle holders to dividends and voting rights. Other types of share-based compensation include performance share awards, performance share units, and restricted share units (collectively with restricted share awards, “restricted shares”), as well as options to purchase common stock.

Share-based compensation expense was recognized in the following line items in the Consolidated Statements of Operations for the three and six months ended June 30, 2019 and 2018:

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
	(in thousands)			
Cost of sales	$ 595	$ 536	$ 1,065	$ 1,090
Research and development	982	1,065	1,775	2,019
Selling, general, and administrative	3,011	2,646	4,905	5,503
Restructuring	—	657	—	829
Total	$ 4,588	$ 4,904	$ 7,745	$ 9,441

For the six months ended June 30, 2019, equity activity related to stock options was as follows:

	Number of Shares	Weighted Average Exercise Price
	(in thousands)	
Balance - December 31, 2018	1,222	$ 34.80
Expired or forfeited	(69)	33.62
Balance - June 30, 2019	1,153	34.87

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For the six months ended June 30, 2019, equity activity related to non-vested restricted shares and performance shares was as follows:

	Number of Shares	Weighted Average Grant Date Fair Value
	(in thousands)	
Balance - December 31, 2018	2,218	$ 20.74
Granted	1,035	11.41
Performance award adjustments	(1)	25.23
Vested	(589)	22.35
Forfeited	(97)	21.79
Balance - June 30, 2019	2,566	16.71

Note 9 — Income Taxes

Income taxes are estimated for each of the jurisdictions in which the Company operates. Deferred income taxes reflect the net tax effect of temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, as well as the tax effect of carryforwards. Realization of net deferred tax assets is dependent on future taxable income. At June 30, 2019, the Company's U.S. deferred tax assets are fully offset by a valuation allowance since the Company cannot conclude that it is more likely than not that these future benefits will be realized.

At the end of each interim reporting period, the effective tax rate is aligned with expectations for the full year. This estimate is used to determine the income tax provision on a year-to-date basis and may change in subsequent interim periods. If necessary, the year-to-date tax benefit for interim period losses is limited to the amount that could be recognizable at the end of the fiscal year.

Loss before income taxes and income tax expense (benefit) for the three and six months ended June 30, 2019 and 2018 were as follows:

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
	(in thousands)			
Loss before income taxes	$ (15,420)	$ (265,659)	$ (33,759)	$ (281,716)
Income tax expense (benefit)	$ 145	$ (28,025)	$ 336	$ (28,255)

The Company's tax expense for the three months ended June 30, 2019 was $0.1 million, compared to a tax benefit of $28.0 million for the comparable prior period. The 2019 tax expense included a $0.1 million expense related to the Company's domestic operations and minimal expense related to the Company's non-U.S. operations, compared to 2018 when the benefit included a $1.3 million benefit related to the Company's domestic operations, and a $26.7 million benefit related to the Company's non-U.S. operations. Although there was a domestic pre-tax loss for the three months ended June 30, 2019 and 2018, the Company did not provide a current tax benefit on domestic pre-tax losses, as the amounts are not realizable on a more-likely-than-not basis. The domestic tax expense for the current period is primarily attributable to the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The non-U.S. tax expense for the three months ended June 30, 2019 is primarily attributable to tax expense on non-U.S operation profits and foreign withholding taxes on unremitted earnings as of June 30, 2019, offset by the amortization of intangible assets.

The Company's tax expense for the six months ended June 30, 2019 was $0.3 million, compared to a tax benefit of $28.3 million for the comparable prior period. The 2019 tax expense included a $0.1 million expense related to the Company's domestic operations, and $0.2 million expense related to the Company's non-U.S. operations, compared to 2018 when the benefit included a $1.2 million benefit related to the Company's domestic operations, and a $27.1 million benefit related to the Company's non-U.S. operations. Although there was a domestic pre-tax loss for the six months ended June 30, 2019 and 2018, the Company did not provide a current tax benefit on domestic pre-tax losses, as the amounts are not realizable on a more-likely-than-not basis. The domestic tax expense for the current period is primarily attributable to the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The non-U.S. tax expense for the six months ended June 30, 2019 is primarily attributable to tax expense on non-U.S operation profits and foreign withholding taxes on unremitted earnings as of June 30, 2019, offset by the amortization of intangible assets.

The domestic tax benefit for the three and six months ended June 30, 2018 is primarily attributable to refundable alternative minimum tax credits in accordance with the 2017 Tax Act, offset by the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The non-U.S. tax benefit for the three and six months ended June 30, 2018 is primarily attributable to the deferred tax benefit recognized on the intangible asset impairment charge incurred during the period.

Note 10 — Segment Reporting and Geographic Information

Veeco operates and measures its results in one operating segment and therefore has one reportable segment: the design, development, manufacture, and support of thin film process equipment primarily sold to make electronic devices.

Veeco categorizes its sales into the following four end-markets:

Advanced Packaging, MEMS & RF Filters

Advanced Packaging includes a portfolio of wafer-level assembly technologies that enable the miniaturization and performance improvement of electronic products, such as smartphones, smartwatches, tablets, and laptops. Micro-Electro Mechanical Systems ("MEMS") includes tiny mechanical devices such as sensors, switches, mirrors, and actuators embedded in semiconductor chips used in vehicles, smartphones, tablets, and games. RF Filters refers to RF filters used in smartphones, tablets, and mobile devices.

LED Lighting, Display & Compound Semiconductor

LED Lighting refers to Light Emitting Diode ("LED") and semiconductor illumination sources used in various applications including, but not limited to, displays such as backlights, general lighting, automotive running lights, and headlamps. Display refers to LEDs used for displays and Organic Light Emitting Diode ("OLED") displays found in outdoor display/signage applications, TVs, smartphones, wearable devices, and tablets. Compound Semiconductor includes Photonics, Power Electronics, and Radio Frequency ("RF") Devices. Photonics refers to laser diodes, Vertical Cavity Surface Emitting Lasers ("VCSEL") in 3D sensing and communications, and various other optical devices. Power Electronics refers to semiconductor devices such as rectifiers, inverters, and converters for the control and conversion of electric power. RF devices refers to radio frequency emitting and receiving devices that enable wireless communications. Such devices include power amplifiers, switches, and transceivers for applications such as mobile (including handsets and base stations), defense, automobile, and the Internet of Things.

Front-End Semiconductor

Front-End Semiconductor refers to the early steps in the process of integrated circuit fabrication where the microchips are created but still remain on the silicon wafer. This category includes Laser Spike Anneal, Ion Beam etch for front-end semiconductor applications, and Ion Beam deposition for EUV mask blanks.

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Scientific & Industrial

Scientific refers to advanced materials research at university research institutions, industry research institutions, industry consortiums, and government research agencies. Industrial refers to large-scale product manufacturing applications including data storage and optical coatings: thin layers of material deposited on a lens or mirror that alters how light reflects and transmits.

Sales by end-market and geographic region for the three and six months ended June 30, 2019 and 2018 were as follows:

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
	(in thousands)			
Sales by end-market				
Advanced Packaging, MEMS & RF Filters	$ 16,443	$ 24,758	$ 39,570	$ 51,911
LED Lighting, Display & Compound Semiconductor	9,692	87,817	23,242	177,733
Front-End Semiconductor	24,509	18,152	47,126	27,609
Scientific & Industrial	47,178	27,052	87,255	59,100
Total	$ 97,822	$ 157,779	$ 197,193	$ 316,353
Sales by geographic region				
United States	$ 39,784	$ 32,939	$ 72,099	$ 56,694
China	19,654	70,457	29,813	145,850
EMEA [(1)]	12,324	25,405	30,151	41,151
Rest of World	26,060	28,978	65,130	72,658
Total	$ 97,822	$ 157,779	$ 197,193	$ 316,353

(1) EMEA consists of Europe, the Middle East, and Africa

For geographic reporting, sales are attributed to the location in which the customer facility is located.

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

Cautionary Statement Regarding Forward Looking Statements

Our discussion below constitutes "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. When used in this Report, the words "believes," "anticipates," "expects," "estimates," "targets," "plans," "intends," "will," and similar expressions related to the future are intended to identify forward-looking statements. All forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from projected results. You should not place undue reliance on any forward-looking statements, which speak only as of the dates they are made.

Executive Summary

We are an innovative manufacturer of semiconductor process equipment. Our proven MOCVD, lithography, laser annealing, ion beam, and single wafer etch & clean technologies play an integral role in the fabrication and packaging of advanced semiconductor devices. With equipment designed to optimize performance, yield, and cost of ownership, we hold leading technology positions in the markets we serve.

We categorize our revenue by the key market segments into which we sell. Our four key markets are: Advanced Packaging, MEMS & RF Filters; LED Lighting, Display & Compound Semiconductor; Front-End Semiconductor; and Scientific & Industrial.

Sales in the Advanced Packaging, MEMS & RF Filter market were driven by shipment of Lithography and PSP systems to Integrated Device Manufacturer ("IDM") and Outsourced Semiconductor and Test ("OSAT") customers in support of advanced packaging processes such as Fan-In and Fan-Out Wafer Level Packaging ("FOWLP"), and Copper Pillar. While Advanced Packaging has typically been associated with logic devices, this quarter reflects continued recent traction in Dynamic Random Access Memory ("DRAM") packaging with our lithography systems. We also saw a repeat shipment of an Advanced Packaging lithography system for a Graphics Processing Unit ("GPU") application. We remain well positioned for future growth in these markets, supported by technology mega-trends such as mobile connectivity and 5G infrastructure, automotive electronics, and big data processing, as well as other Advanced Packaging applications.

Sales in the LED Lighting, Display & Compound Semiconductor market were limited in the second quarter. We recently shipped an advanced MOCVD system to a leading compound semiconductor manufacturer who is initially piloting the system for ROY LEDs as well as testing processes for other photonics applications including VCSELs. We are also working with another customer to place another beta system. We expect future business in this market to come from more applications in VCSELs, 3D sensors, laser diodes, and RF devices. Our broad portfolio of MOCVD and PSP technologies have been developed to support these emerging applications.

Sales in the Front-End Semiconductor market were driven by shipments of our laser annealing systems, as well as our Low Defect Density Ion Beam Deposition ("LDD-IBD") system for Extreme Ultraviolet ("EUV") Mask Blank Production. We believe demand for these two product lines will continue to provide future growth for us.

Sales in the Scientific & Industrial market were supported by shipment of Ion Beam systems for data storage applications as well as a variety of high end optical coating applications. Demand for our Ion Beam products for Data Storage is being driven by the requirements to improve areal density of magnetic heads for hard disk drive manufacturers as well as an overall projected volume increase of thin film magnetic heads. These two factors taken together are driving additional capacity and equipment upgrades. While equipment demand from each individual market may fluctuate quarter to quarter, the diverse customer base has historically provided a relatively stable revenue stream for the Company.

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Results of Operations

For the three months ended June 30, 2019 and 2018

The following table presents revenue and expense line items reported in our Consolidated Statements of Operations for 2019 and 2018 and the period-over-period dollar and percentage changes for those line items. Our results of operations are reported as one business segment, represented by our single operating segment.

	Three Months Ended June 30, 2019		2018		Change Period to Period	
	(dollars in thousands)					
Net sales	$ 97,822	100%	$ 157,779	100%	$ (59,957)	(38)%
Cost of sales	61,537	63%	102,384	65%	(40,847)	(40)%
Gross profit	36,285	37%	55,395	35%	(19,110)	(34)%
Operating expenses, net:						
Research and development	22,922	23%	24,930	16%	(2,008)	(8)%
Selling, general, and administrative	19,757	20%	24,274	15%	(4,517)	(19)%
Amortization of intangible assets	4,243	4%	10,386	7%	(6,143)	(59)%
Restructuring	616	1%	2,917	2%	(2,301)	(79)%
Acquisition costs	—	-	1,316	1%	(1,316)	*
Asset impairment	—	-	252,343	160%	(252,343)	*
Other, net	(44)	-	443	-	(487)	*
Total operating expenses, net	47,494	49%	316,609	201%	(269,115)	(85)%
Operating income (loss)	(11,209)	(11)%	(261,214)	(166)%	250,005	(96)%
Interest income (expense), net	(4,211)	(4)%	(4,445)	(3)%	234	(5)%
Income (loss) before income taxes	(15,420)	(16)%	(265,659)	(168)%	250,239	(94)%
Income tax expense (benefit)	145	-	(28,025)	(18)%	28,170	*
Net income (loss)	$ (15,565)	(16)%	$ (237,634)	(151)%	$ 222,069	(93)%

* Not meaningful

Net Sales

The following is an analysis of sales by market and by region:

	Three Months Ended June 30, 2019		2018		Change Period to Period	
	(dollars in thousands)					
Sales by market						
Advanced Packaging, MEMS & RF Filters	$ 16,443	17%	$ 24,758	16%	$ (8,315)	(34)%
LED Lighting, Display & Compound Semiconductor	9,692	10%	87,817	55%	(78,125)	(89)%
Front-End Semiconductor	24,509	25%	18,152	12%	6,357	35%

Scientific & Industrial	47,178	48%	27,052	17%	20,126	74%
Total	$ 97,822	100%	$ 157,779	100%	$ (59,957)	(38)%
Sales by geographic region						
United States	$ 39,784	40%	$ 32,939	21%	$ 6,845	21%
China	19,654	20%	70,457	45%	(50,803)	(72)%
EMEA	12,324	13%	25,405	16%	(13,081)	(51)%
Rest of World	26,060	27%	28,978	18%	(2,918)	(10)%
Total	$ 97,822	100%	$ 157,779	100%	$ (59,957)	(38)%

Sales decreased for the three months ended June 30, 2019 against the comparable prior year period principally in the LED Lighting, Display & Compound Semiconductor market, partially offset by increases in the Scientific & Industrial and Front-End Semiconductor markets. Pricing was not a significant driver of the change in total sales. By geography, sales decreased in the China, EMEA, and Rest of World regions, partially offset by an increase in the United States region. The most significant decrease occurred in the China region, which was largely attributable to the decreased sales in the LED Lighting, Display & Compound Semiconductor market. We do not expect significant new orders for this market in this region in the near future. We expect there will continue to be year-to-year variations in our future sales distribution across markets and geographies.

Gross Profit

In the second quarter of 2019, gross profit decreased compared to the second quarter of 2018 due to a decrease in sales volume, partially offset by increased gross margins. Gross margins increased principally due to product and region mix of sales in the periods.

Research and Development

The markets we serve are characterized by continuous technological development and product innovation, and we invest in various research and development initiatives to maintain our competitive advantage and achieve our growth objectives. Research and development expenses decreased for the three months ended June 30, 2019 against the comparable prior period primarily related to personnel-related expenses and professional fees as a result of our initiative to streamline operations, enhance efficiency, and reduce costs.

Selling, General, and Administrative

Selling, general, and administrative expenses decreased primarily related to personnel-related expenses and professional fees as a result of our initiative to streamline operations, enhance efficiency, and reduce costs.

Amortization Expense

The decrease in amortization expense is a result of the impairment of intangible assets during the second quarter of 2018.

Restructuring Expense

During the second quarter of 2018, we initiated plans to further reduce excess capacity associated with the manufacture and support of our advanced packaging lithography and 3D wafer inspection systems by consolidating these operations into our San Jose, California facility. As a result of this and other cost saving initiatives, we announced headcount reductions of approximately 40 employees. During the three months ended June 30, 2019, additional accruals were recognized and payments were made related to these restructuring activities.

We continued to record restructuring charges in the second quarter of 2019 in an effort to streamline operations, enhance efficiencies, and reduce costs.

Acquisition Costs

Acquisition costs incurred during 2018 were non-recurring charges incurred in connection with the acquisition of the Ultratech business, as well as legal and professional fees incurred in connection with certain integration activities.

Asset impairment

During the second quarter of 2018, we lowered our projected results for the Ultratech asset group, which were significantly below the projected results at the time of the acquisition. The reduced projections were based on lower than expected unit volume of certain smartphones, which incorporate advanced packaging methods such as FOWLP, and a delay in the adoption of FOWLP advanced packaging by other electronics manufacturers, both of which slowed orders and reduced revenue projections for our advanced packaging lithography systems. In addition, there has been a delay in the build out of 28nm facilities by companies in China who were expected to purchase our LSA systems. Taken together, the reduced projections identified during the second quarter of 2018 required us to assess the Ultratech asset group for impairment. As a result of the analysis, during the second quarter of 2018 we recorded a $252.3 million non-cash intangible asset impairment charge.

Interest Income (Expense)

We recorded net interest expense of $4.2 million for the three months ended June 30, 2019, compared to $4.4 million for the comparable prior year period. Included in interest expense for the three months ended June 30, 2019 and 2018 were non-cash charges of $3.1 million and $2.9 million, respectively, related to the amortization of debt discount and transaction costs of the Convertible Senior Notes.

Income Taxes

At the end of each interim reporting period, we estimate the effective income tax rate expected to be applicable for the full year. This estimate is used to determine the income tax provision or benefit on a year-to-date basis and may change in subsequent interim periods.

Our tax expense for the three months ended June 30, 2019 was $0.1 million compared to a tax benefit of $28.0 million for the comparable prior period. The 2019 tax expense included an expense of $0.1 million related to our domestic operations and minimal expense related to our non-U.S. operations, compared to 2018 when the benefit included a $1.3 million benefit related to our domestic operations, and a $26.7 million benefit related to our non-U.S. operations. Although there was a domestic pre-tax loss for the three months ended June 30, 2019 and 2018, we did not provide a current tax benefit on domestic pre-tax losses as the amounts are not realizable on a more-likely-than-not basis. The domestic tax expense for the current period is primarily attributable to the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The current period non-U.S. tax expense is primarily attributable to tax expense on non-U.S operation profits and foreign withholding taxes on unremitted earnings as of June 30, 2019, offset by the amortization of intangible assets.

The comparable period domestic tax benefit is primarily attributable to refundable alternative minimum tax credits in accordance with the 2017 Tax Act, offset by the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The comparable period non-U.S. tax benefit is primarily attributable to the deferred tax benefit recognized on the intangible asset impairment charge incurred during the period.

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For the six months ended June 30, 2019 and 2018

The following table presents revenue and expense line items reported in our Consolidated Statements of Operations for 2019 and 2018 and the period-over-period dollar and percentage changes for those line items.

	Six Months Ended June 30, 2019		Six Months Ended June 30, 2018		Change Period to Period	
	(dollars in thousands)					
Net sales	$ 197,193	100%	$ 316,353	100%	$ (119,160)	(38)%
Cost of sales	126,192	64%	204,278	65%	(78,086)	(38)%
Gross profit	71,001	36%	112,075	35%	(41,074)	(37)%
Operating expenses, net:						
Research and development	46,262	23%	49,250	16%	(2,988)	(6)%
Selling, general, and administrative	39,660	20%	50,657	16%	(10,997)	(22)%
Amortization of intangible assets	8,460	4%	23,918	8%	(15,458)	(65)%
Restructuring	2,046	1%	5,612	2%	(3,566)	(64)%
Acquisition costs	—	-	2,657	1%	(2,657)	*
Asset impairment	—	-	252,343	80%	(252,343)	*
Other, net	(80)	-	286	-	(366)	*
Total operating expenses, net	96,348	49%	384,723	122%	(288,375)	(75)%
Operating income (loss)	(25,347)	(13)%	(272,648)	(86)%	247,301	(91)%
Interest income (expense), net	(8,412)	(4)%	(9,068)	(3)%	656	(7)%
Income (loss) before income taxes	(33,759)	(17)%	(281,716)	(89)%	247,957	(88)%
Income tax expense (benefit)	336	-	(28,255)	(9)%	28,591	*
Net income (loss)	$ (34,095)	(17)%	$ (253,461)	(80)%	$ 219,366	(87)%

* Not meaningful

Net Sales

The following is an analysis of sales by market and by region:

	Six Months Ended June 30, 2019		Six Months Ended June 30, 2018		Change Period to Period	
	(dollars in thousands)					
Sales by market						
Advanced Packaging, MEMS & RF Filters	$ 39,570	20%	$ 51,911	16%	$ (12,341)	(24)%
LED Lighting, Display & Compound Semiconductor	23,242	12%	177,733	56%	(154,491)	(87)%
Front-End Semiconductor	47,126	24%	27,609	9%	19,517	71%
Scientific & Industrial	87,255	44%	59,100	19%	28,155	48%
Total	$ 197,193	100%	$ 316,353	100%	$ (119,160)	(38)%

Sales by geographic region						
United States	$ 72,099	37%	$ 56,694	18%	$ 15,405	27%
China	29,813	15%	145,850	46%	(116,037)	(80)%
EMEA	30,151	15%	41,151	13%	(11,000)	(27)%
Rest of World	65,130	33%	72,658	23%	(7,528)	(10)%
Total	$ 197,193	100%	$ 316,353	100%	$ (119,160)	(38)%

Sales decreased for the six months ended June 30, 2019 against the comparable prior year period principally in the LED Lighting, Display & Compound Semiconductor market, partially offset by increases in the Scientific & Industrial and Front-End Semiconductor markets. Pricing was not a significant driver of the change in total sales. By geography, sales decreased in the China, EMEA, and Rest of World regions, partially offset by increases in the United States region. The most significant decrease occurred in the China region, which was largely attributable to the decreased sales in the LED Lighting, Display & Compound Semiconductor market. We do not expect significant new orders for this market in this region in the near future. We expect there will continue to be year-to-year variations in our future sales distribution across markets and geographies.

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In the six months ended June 30, 2019, gross profit decreased compared to 2018 due to a decrease in sales volume, partially offset by increased gross margins. Gross margins increased principally due to product and region mix of sales in the periods.

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The markets we serve are characterized by continuous technological development and product innovation, and we invest in various research and development initiatives to maintain our competitive advantage and achieve our growth objectives. Research and development expenses decreased for the six months ended June 30, 2019 against the comparable prior period primarily related to personnel-related expenses and professional fees as a result of our initiative to streamline operations, enhance efficiency, and reduce costs.

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The decrease in amortization expense is a result of the impairment of intangible assets during the second quarter of 2018.

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During the second quarter of 2018, we initiated plans to further reduce excess capacity associated with the manufacture and support of our advanced packaging lithography and 3D wafer inspection systems by consolidating these operations into our San Jose, California facility. As a result of this and other cost saving initiatives, we announced headcount reductions of approximately 40 employees. During the six months ended June 30, 2019, additional accruals were recognized and payments were made related to these restructuring activities.

We continued to record restructuring charges in the first and second quarters of 2019 in an effort to streamline operations, enhance efficiencies, and reduce costs.

Acquisition Costs

Acquisition costs incurred during 2018 were non-recurring charges incurred in connection with the acquisition of the Ultratech business, as well as legal and professional fees incurred in connection with certain integration activities.

Asset impairment

During the second quarter of 2018, we lowered our projected results for the Ultratech asset group, which were significantly below the projected results at the time of the acquisition. The reduced projections were based on lower than expected unit volume of certain smartphones, which incorporate advanced packaging methods such as FOWLP, and a delay in the adoption of FOWLP advanced packaging by other electronics manufacturers, both of which slowed orders and reduced revenue projections for our advanced packaging lithography systems. In addition, there has been a delay in the build out of 28nm facilities by companies in China who were expected to purchase our LSA systems. Taken together, the reduced projections identified during the second quarter of 2018 required us to assess the Ultratech asset group for impairment. As a result of the analysis, during the second quarter of 2018 we recorded a $252.3 million non-cash intangible asset impairment charge.

Interest Income (Expense)

We recorded net interest expense of $8.4 million for the six months ended June 30, 2019, compared to $9.1 million for the comparable prior year period. Included in interest expense for the six months ended June 30, 2019 and 2018 were non-cash charges of $6.2 million and $5.8 million, respectively, related to the amortization of debt discount and transaction costs of the Convertible Senior Notes.

Income Taxes

At the end of each interim reporting period, we estimate the effective income tax rate expected to be applicable for the full year. This estimate is used to determine the income tax provision or benefit on a year-to-date basis and may change in subsequent interim periods.

Our tax expense for the six months ended June 30, 2019 was $0.3 million compared to a tax benefit of $28.3 million for the comparable prior period. The 2019 tax expense included an expense of $0.1 million related to our domestic operations, and $0.2 million related to our non-U.S. operations, compared to 2018 when the benefit included a $1.2 million benefit related to our domestic operations, and a $27.1 million benefit related to our non-U.S. operations. Although there was a domestic pre-tax loss for the six months ended June 30, 2019 and 2018, we did not provide a current tax benefit on domestic pre-tax losses as the amounts are not realizable on a more-likely-than-not basis. The domestic tax expense for the current period is primarily attributable to the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The current period non-U.S. tax expense is primarily attributable to tax expense on non-U.S operation profits and foreign withholding taxes on unremitted earnings as of June 30, 2019, offset by the amortization of intangible assets.

The comparable period domestic tax benefit is primarily attributable to refundable alternative minimum tax credits in accordance with the 2017 Tax Act, offset by the tax amortization of indefinite-lived intangible assets that is not available to offset U.S. deferred tax assets. The comparable period non-U.S. tax benefit is primarily attributable to the intangible asset impairment charge incurred during the period.

Liquidity and Capital Resources

Our cash and cash equivalents, restricted cash, and short-term investments are as follows:

	June 30, 2019	December 31, 2018
	(in thousands)	
Cash and cash equivalents	$ 161,715	$ 212,273
Restricted cash	733	809
Short-term investments	84,495	48,189
Total	$ 246,943	$ 261,271

At June 30, 2019 and December 31, 2018, cash and cash equivalents of $42.6 million and $66.9 million, respectively, were held outside the United States. As of June 30, 2019, we had $13.2 million of accumulated undistributed earnings generated by our non-U.S. subsidiaries for which the U.S. repatriation tax has been provided and did not require the use of cash due to the use of net operating loss carryforwards. Approximately $8.5 million of undistributed earnings would be subject to foreign withholding taxes if distributed back to the United States. As of December 31, 2018, we had accrued for, and subsequently paid in January 2019, approximately $1.9 million of withholding tax related to distributions made in 2018. We believe that our projected cash flow from operations, combined with our cash and short term investments, will be sufficient to meet our projected working capital requirements, contractual obligations, and other cash flow needs for the next twelve months, including scheduled interest payments on our Convertible Senior Notes due 2023.

A summary of the cash flow activity for the six months ended June 30, 2019 and 2018 is as follows:

Cash Flows from Operating Activities

	Six Months Ended June 30, 2019	2018
	(in thousands)	
Net income (loss)	$ (34,095)	$ (253,461)
Non-cash items:		
Depreciation and amortization	17,315	32,306
Non-cash interest expense	6,219	5,771
Deferred income taxes	10	(27,658)
Share-based compensation expense	7,745	9,441
Asset impairment	—	252,343
Changes in operating assets and liabilities	(5,335)	(76,182)
Net cash provided by (used in) operating activities	$ (8,141)	$ (57,440)

Net cash used in operating activities was $8.1 million for the six months ended June 30, 2019 and was due to the net loss of $34.1 million plus adjustments for non-cash items of $31.3 million, offset by a decrease in cash flow from changes in operating assets and liabilities of $5.3 million. The changes in operating assets and liabilities were largely attributable to decreases in accounts payable and accrued expenses and increases in prepaid expenses, partially offset by 1) increases in customer deposits and deferred revenue; 2) decreases in accounts receivable; and 3) decreases in inventory.

Cash Flows from Investing Activities

	Six Months Ended June 30, 2019	2018
	(in thousands)	
Capital expenditures	$ (6,441)	$ (3,796)
Changes in investments, net	(35,608)	(20,035)
Net cash provided by (used in) investing activities	$ (42,049)	$ (23,831)

The cash used in investing activities during the six months ended June 30, 2019 was attributable to net changes in investments as well as capital expenditures.

Cash Flows from Financing Activities

	Six Months Ended June 30, 2019	2018
	(in thousands)	
Settlement of equity awards, net of withholding taxes	$ (457)	$ (820)
Purchases of common stock	—	(1,225)
Net cash provided by (used in) financing activities	$ (457)	$ (2,045)

The cash used in financing activities for the six months ended June 30, 2019 was related to the net cash used to settle taxes related to employee equity programs.

Convertible Senior Notes

On January 10, 2017, we issued $345.0 million of 2.70% convertible senior unsecured notes (the “Convertible Senior Notes”). We received net proceeds, after deducting underwriting discounts and fees and expenses payable by us, of approximately $335.8 million. The Convertible Senior Notes bear interest at a rate of 2.70% per year, payable semiannually in arrears on January 15 and July 15 of each year, commencing on July 15, 2017. The Convertible Senior Notes mature on January 15, 2023, unless earlier purchased by the Company, redeemed, or converted. We believe that we have sufficient capital resources and cash flows from operations to support scheduled interest payments on this debt.

Contractual Obligations and Commitments

We have commitments under certain contractual arrangements to make future payments for goods and services. These contractual arrangements secure the rights to various assets and services to be used in the future in the normal course of business. We expect to fund these contractual arrangements with cash generated from operations in the normal course of business.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements that have, or are reasonably likely to have, a current or future material effect on our financial condition, changes in financial condition, expenses, and results of operations, liquidity, capital expenditures or capital resources other than bank guarantees and purchase commitments disclosed in the preceding footnotes.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Interest Rate Risk

Our exposure to market rate risk for changes in interest rates primarily relates to our investment portfolio. We centrally manage our investment portfolios considering investment opportunities and risks, tax consequences, and overall financing strategies. Our investment portfolio includes fixed-income securities with a fair value of approximately $84.5 million at June 30, 2019. These securities are subject to interest rate risk and, based on our investment portfolio at June 30, 2019, a 100 basis point increase in interest rates would result in a decrease in the fair value of the portfolio of $0.2 million. While an increase in interest rates may reduce the fair value of the investment portfolio, we will not realize the losses in the Consolidated Statements of Operations unless the individual fixed-income securities are sold prior to recovery or the loss is determined to be other-than-temporary.

Currency Exchange Risk

We conduct business on a worldwide basis and, as such, a portion of our revenues, earnings, and net investments in foreign affiliates is exposed to changes in currency exchange rates. The economic impact of currency exchange rate movements is complex because such changes are often linked to variability in real growth, inflation, interest rates, governmental actions, and other factors. These changes, if material, could cause us to adjust our financing and operating strategies. Consequently, isolating the effect of changes in currency does not incorporate these other important economic factors.

Changes in currency exchange rates could affect our foreign currency denominated monetary assets and liabilities and forecasted cash flows. We enter into monthly forward derivative contracts with the intent of mitigating a portion of this risk. We only use derivative financial instruments in the context of hedging and not for speculative purposes and had not designated our foreign exchange derivatives as hedges. Accordingly, changes in fair value from these contracts are recorded as “Other, net” in our Consolidated Statements of Operations. We execute derivative transactions with highly rated financial institutions to mitigate counterparty risk.

Our net sales to customers located outside of the United States represented approximately 60% and 63% of our total net sales for the three and six months ended June 30, 2019, respectively, and 79% and 82% for the comparable 2018 periods. We expect that net sales to customers outside the United States will continue to represent a large percentage of our total net sales. Our sales denominated in currencies other than the U.S. dollar represented 4% and 5% of total net sales in the three and six months ended June 30, 2019, and 1% for the comparable 2018 periods.

A 10% change in foreign exchange rates would have an immaterial impact on the consolidated results of operations since most of our sales outside the United States are denominated in U.S. dollars.

Item 4. Controls and Procedures

Management's Report on Internal Control Over Financial Reporting

Our principal executive and financial officers have evaluated and concluded that our disclosure controls and procedures are effective as of June 30, 2019. The disclosure controls and procedures are designed to ensure that the information required to be disclosed in this report filed under the Securities Exchange Act of 1934 is recorded, processed, summarized, and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and is accumulated and communicated to our principal executive and financial officers as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

During the quarter ended June 30, 2019, there were no changes in internal control that have materially affected or are reasonably likely to materially affect internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings

On June 8, 2018, an Ultratech shareholder who received Veeco stock as part of the consideration for the Ultratech acquisition filed a purported class action complaint in the Superior Court of the State of California, County of Santa Clara, captioned Wolther v. Maheshwari et al., Case No. 18CV329690, on behalf of himself and others who purchased or acquired shares of Veeco pursuant to the registration statement and prospectus which Veeco filed with the SEC in connection with the Ultratech acquisition (the "Wolther Action"). On August 2 and August 8, 2018, two purported class action complaints substantially similar to the Wolther Action were filed on behalf of different plaintiffs in the same court as the Wolther Action. These cases have been consolidated with the Wolther Action, and a consolidated complaint was filed on December 11, 2018. The consolidated complaint seeks to recover damages and fees under Sections 11, 12, and 15 of the Securities Act of 1933 for, among other things, alleged false/misleading statements in the registration statement and prospectus relating to the Ultratech acquisition, relating primarily to the alleged failure to disclose delays in the advanced packaging business, increased MOCVD competition in China, and an intellectual property dispute. Veeco is defending this matter vigorously.

On December 21, 2018, a purported Veeco stockholder filed a derivative action in the Superior Court of the State of California, County of Santa Clara, captioned Vladimir Gusinsky Revocable Trust v. Peeler, et al., Case No. 18CV339925, on behalf of nominal defendant Veeco. The complaint seeks to assert claims for breach of fiduciary duty, waste of corporate assets, and unjust enrichment against current and former Veeco directors premised on purported misstatements and omissions in the registration statement relating to the Ultratech acquisition. The court ordered this action stayed until a future case management conference. Veeco is defending this matter vigorously.

The Company is involved in various other legal proceedings arising in the normal course of business. The Company does not believe that the ultimate resolution of these matters will have a material adverse effect on its consolidated financial position, results of operations, or cash flows.

Item 1A. Risk Factors

Information regarding risk factors appears in the Safe Harbor Statement at the beginning of this quarterly report on Form 10-Q and in Part I — Item 1A of our 2018 Form 10-K. There have been no material changes from the risk factors previously disclosed in our 2018 Form 10-K, except for the following.

The following risk factor is added:

Changes in U.S. trade policy and export controls and ongoing trade disputes between the U.S. and China have adversely affected, and may continue to adversely affect, our business, results of operations, and financial condition.

The U.S. government has recently enacted changes in trade policy, including the imposition of tariffs on certain items, proposed tariffs on additional items and export controls. On May 15, 2019, the President of the United States issued an Executive Order that authorized the creation and implementation of controls over transactions involving Chinese and possibly other entities involving threats to U.S. national security. On the same day, the U.S. Commerce Department added Huawei (a multinational technology company with its headquarters in China) and many of its affiliates to the Entity List, which essentially requires U.S. companies and others to obtain licenses before providing commodities, software, and technology subject to the regulations. Further, the Trump Administration is in the process of developing and implementing new regulations designed to address concerns about the export of emerging and foundational technologies to China. In addition, the Trump Administration has announced plans to impose additional controls on the export of items to China and other countries. These actions are expected to lead to additional restrictions on the export of products that include or enable certain technologies, including products we provide to China-based customers.

These new tariffs, and other changes in U.S. trade policy and export controls, as well as sanctions imposed by the U.S. against certain Chinese companies, have triggered retaliatory action by China and could trigger further retaliation. For example, China has instituted or is considering imposing trade sanctions on certain U.S. goods, as well as the imposition of sanctions that will deny U.S. companies access to critical raw materials. Also, China has provided, and is expected to continue to provide, significant assistance, financial or otherwise, to their domestic industries, including some of our competitors, and to intervene in support of national industries and/or competitors. We face increasing competition as a result of significant investment in the semiconductor industry by the Chinese government and various state-owned or affiliated entities that is intended to advance China's stated national policy objectives. In addition, the Chinese government may restrict us from participating in the China market or may prevent us from competing effectively with Chinese companies.

A “trade war” of this nature or other governmental action related to tariffs or international trade agreements or policies has the potential to adversely affect demand for our products, our costs, customers, suppliers, and/or the U.S. economy or certain sectors thereof and, thus, to have a material adverse effect on our business, results of operations and financial condition.

Further, we hold inventory of products affected by the recent U.S. government actions and there is uncertainty relating to the disposition of this inventory. While we continue to take steps to mitigate our exposure to this developing situation, if the sale of these products is delayed or we are unable to return or dispose of our inventory on favorable economic terms, we may experience order cancelations, incur additional carrying costs for the inventory or otherwise record losses associated with the inventory.

In addition, we have experienced increasing difficulty and uncertainty in obtaining export licenses required to sell products to certain foreign customers. Further, the U.S. Bureau of Industry and Security (BIS) has indicated its intention to eliminate license exception CIV, which we utilize to facilitate the shipment of many of our products to customers in China. Without this license exception, we will be required to obtain export licenses from BIS prior to shipment. This would likely create delay and uncertainty, which would make our products less attractive to customers in China than competing products from suppliers in Europe and elsewhere which do not require an export license for shipment to China. This difficulty and uncertainty has adversely affected our ability to compete for and win business from customers in these foreign jurisdictions. Foreign customers affected by these and future U.S. government sanctions or threats of sanctions may respond by developing their own solutions to replace our products or by utilizing our foreign competitors’ products.

Tariff and trade policy discussions between the U.S., China and its other trading partners are ongoing and fluid. These tariffs and other policy changes are subject to a number of uncertainties as they are implemented. The ultimate reaction of other countries and the individuals in each of these countries, and the impact on the U.S., the global economy, and our business, results of operations and financial condition, cannot be predicted at this time, nor can we predict the impact of any other potential developments with respect to global trade.

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

On December 11, 2017, Veeco's Board of Directors authorized a program to repurchase up to $100 million of the Company's outstanding common stock to be completed through December 11, 2019. We did not purchase any shares during the second quarter of 2019. At June 30, 2019, $14.3 million of the $100 million had been utilized. Repurchases may be made from time to time on the open market or in privately negotiated transactions in accordance with applicable federal securities laws. The timing and amount of future repurchases, if any, will depend upon market conditions, SEC regulations, and other factors. The repurchases would be funded using available cash balances and cash generated from operations. The program does not obligate us to acquire any particular amount of common stock and may be modified or suspended at any time at our discretion.

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not Applicable.

Item 5. Other Information

None.

Item 6. Exhibits

Unless otherwise indicated, each of the following exhibits has been filed with the Securities and Exchange Commission by Veeco under File No. 0-16244.

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Exhibit	Filing Date	Filed or Furnished Herewith
31.1	Certification of Chief Executive Officer pursuant to Rule 13a—14(a) or Rule 15d—14(a) of the Securities and Exchange Act of 1934.				*
31.2	Certification of Chief Financial Officer pursuant to Rule 13a—14(a) or Rule 15d—14(a) of the Securities and Exchange Act of 1934.				*
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes - Oxley Act of 2002.				*
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes - Oxley Act of 2002.				*
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.				**
101.XSD	XBRL Schema.				**
101.PRE	XBRL Presentation.				**
101.CAL	XBRL Calculation.				**
101.DEF	XBRL Definition.				**
101.LAB	XBRL Label.				**

* Filed herewith
** Filed herewith electronically

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on August 5, 2019.

Veeco Instruments Inc.

By: /S/ WILLIAM J. MILLER, Ph.D.
William J. Miller, Ph.D.
Chief Executive Officer

By: /s/ SHUBHAM MAHESHWARI
Shubham Maheshwari
Executive Vice President, Chief Financial Officer, and Chief Operating Officer

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULE 13a — 14(a) or RULE 15d — 14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934

I, William J. Miller, Ph.D., certify that:

1. I have reviewed this quarterly report on Form 10-Q for the period ended June 30, 2019 of Veeco Instruments Inc.;

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

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

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

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

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

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

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

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

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

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

By: /s/ WILLIAM J. MILLER, Ph.D.
William J. Miller, Ph.D.
Chief Executive Officer
Veeco Instruments Inc.
August 5, 2019

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULE 13a — 14(a) or RULE 15d — 14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934

I, Shubham Maheshwari, certify that:

1. I have reviewed this quarterly report on Form 10-Q for the period ended June 30, 2019 of Veeco Instruments Inc.;

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

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

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

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

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

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

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

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

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

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

By: /s/ SHUBHAM MAHESHWARI
Shubham Maheshwari
Executive Vice President, Chief Financial Officer, and Chief Operating Officer
Veeco Instruments Inc.
August 5, 2019

Exhibit 32.1

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

In connection with the quarterly report of Veeco Instruments Inc. (the "Company") on Form 10-Q for the period ended June 30, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, William J. Miller, Ph.D., Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

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

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

By: /s/ WILLIAM J. MILLER Ph.D.
William J. Miller, Ph.D.
Chief Executive Officer
Veeco Instruments Inc.
August 5, 2019

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

Exhibit 32.2

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

In connection with the quarterly report of Veeco Instruments Inc. (the “Company”) on Form 10-Q for the period ended June 30, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Shubham Maheshwari, Executive Vice President, Chief Financial Officer, and Chief Operating Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

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

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

By: /s/ SHUBHAM MAHESHWARI
Shubham Maheshwari
Executive Vice President, Chief Financial Officer, and Chief Operating Officer
Veeco Instruments Inc.
August 5, 2019

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