MKS INSTRUMENTS INC
Form 10-Q
November 06, 2018

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 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 September 30, 2018

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _______________ to _______________

Commission file number 0-23621

MKS INSTRUMENTS, INC.

(Exact name of registrant as specified in its charter)

| | |
|---|---|
| Massachusetts<br>(State or other jurisdiction<br>of incorporation or organization) | 04-2277512<br>(I.R.S. Employer<br>Identification No.) |
| 2 Tech Drive, Suite 201, Andover, Massachusetts<br>(Address of principal executive offices) | 01810<br>(Zip Code) |

Registrant’s telephone number, including area code (978) 645-5500

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 and post such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer,"

"accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act:

| | |
|---|---|
| Large accelerated filer | Accelerated filer |
| Non-accelerated filer | Smaller reporting company |
| | Emerging growth company |

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

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

As of October 30, 2018 the registrant had 53,986,114 shares of common stock outstanding.

MKS INSTRUMENTS, INC.

FORM 10-Q

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PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS.

MKS INSTRUMENTS, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS

(in thousands, except share and per share data)

(Unaudited)

| ASSETS | September 30, 2018 | December 31, 2017 |
| --- | --- | --- |
| Current assets: | | |
| Cash and cash equivalents, including restricted cash | $ 399,850 | $ 333,887 |
| Short-term investments | 219,776 | 209,434 |
| Trade accounts receivable, net of allowance for doubtful accounts of $4,761 and $4,135 at September 30, 2018 and December 31, 2017, respectively | 318,470 | 300,308 |
| Inventories, net | 399,077 | 339,081 |
| Other current assets | 75,298 | 53,543 |
| Total current assets | 1,412,471 | 1,236,253 |
| | | |
| Property, plant and equipment, net | 180,182 | 171,782 |
| Goodwill | 587,861 | 591,047 |
| Intangible assets, net | 331,288 | 366,398 |
| Long-term investments | 10,404 | 10,655 |
| Other assets | 42,390 | 37,883 |
| Total assets | $ 2,564,596 | $ 2,414,018 |
| | | |
| LIABILITIES AND STOCKHOLDERS' EQUITY | | |
| Current liabilities: | | |
| Short-term debt | $ 6,130 | $ 2,972 |
| Accounts payable | 81,486 | 82,518 |
| Accrued compensation | 74,472 | 96,147 |
| Income taxes payable | 12,942 | 21,398 |
| Deferred revenue | 9,136 | 12,842 |
| Other current liabilities | 78,327 | 73,945 |
| Total current liabilities | 262,493 | 289,822 |
| | | |
| Long-term debt, net | 342,970 | 389,993 |
| Non-current deferred taxes | 61,540 | 61,571 |
| Non-current accrued compensation | 56,888 | 51,700 |
| Other liabilities | 30,412 | 32,025 |

| | | |
|---|---|---|
| Total liabilities | $ 754,303 | $ 825,111 |
| Commitments and contingencies (Note 19) | | |
| Stockholders’ equity: | | |
| Preferred Stock, $0.01 par value per share, 2,000,000 shares authorized; none issued and outstanding | — | — |
| Common Stock, no par value, 200,000,000 shares authorized; 53,984,623 and 54,355,535 shares issued and outstanding at September 30, 2018 and December 31, 2017, respectively | 113 | 113 |
| Additional paid-in capital | 786,138 | 789,644 |
| Retained earnings | 1,023,959 | 795,698 |
| Accumulated other comprehensive income | 83 | 3,452 |
| Total stockholders’ equity | 1,810,293 | 1,588,907 |
| Total liabilities and stockholders’ equity | $ 2,564,596 | $ 2,414,018 |

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

MKS INSTRUMENTS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

AND COMPREHENSIVE INCOME

(in thousands, except per share data)

(Unaudited)

| | Three Months Ended | | Nine Months Ended | |
|---|---|---|---|---|
| | September 30, | | September 30, | |
| | 2018 | 2017 | 2018 | 2017 |
| Net revenues: | | | | |
| Products | $426,255 | $428,891 | $1,432,931 | $1,243,146 |
| Services | 60,897 | 57,376 | 181,636 | 161,031 |
| Total net revenues | 487,152 | 486,267 | 1,614,567 | 1,404,177 |
| Cost of revenues: | | | | |
| Cost of products | 219,311 | 226,445 | 747,522 | 662,985 |
| Cost of services | 35,981 | 31,827 | 97,453 | 88,067 |
| Total cost of revenues (exclusive of amortization shown separately below) | 255,292 | 258,272 | 844,975 | 751,052 |
| Gross profit | 231,860 | 227,995 | 769,592 | 653,125 |
| Research and development | 31,898 | 32,548 | 103,259 | 99,510 |
| Selling, general and administrative | 70,822 | 71,347 | 229,952 | 217,546 |
| Acquisition and integration costs | 36 | 2,466 | (1,132) | 4,698 |
| Restructuring | 1,364 | 10 | 3,374 | 2,596 |
| Environmental costs | — | — | 1,000 | — |
| Asset impairment | — | — | — | 6,719 |
| Fees and expenses related to repricing of term loan | — | 492 | 378 | 492 |
| Amortization of intangible assets | 10,695 | 10,977 | 32,786 | 34,946 |
| Income from operations | 117,045 | 110,155 | 399,975 | 286,618 |
| Interest income | 1,516 | 873 | 4,077 | 1,896 |
| Interest expense | 3,719 | 7,172 | 13,071 | 23,001 |
| Gain on sale of business | — | — | — | 74,856 |
| Other expense, net | 326 | 2,485 | 1,179 | 3,741 |
| Income before income taxes | 114,516 | 101,371 | 389,802 | 336,628 |
| Provision for income taxes | 21,239 | 25,377 | 68,542 | 75,134 |
| Net income | $93,277 | $75,994 | $321,260 | $261,494 |
| Other comprehensive income: | | | | |
| Changes in value of financial instruments designated as cash flow hedges, net of tax expense (benefit)[1] | $163 | $(908) | $8,053 | $(3,578) |
| Foreign currency translation adjustments, net of tax of $0 | (3,576) | 8,088 | (11,314) | 30,352 |
| Unrecognized pension gain (loss), net of tax expense (benefit)[2] | 24 | (565) | (13) | (204) |
| Unrealized gain (loss) on investments, net of tax expense (benefit)[3] | 230 | 1,301 | (95) | 1,137 |
| Total comprehensive income | $90,118 | $83,910 | $317,891 | $289,201 |

| | | | | |
|---|---|---|---|---|
| Net income per share: | | | | |
| Basic | $1.71 | $1.40 | $5.89 | $4.84 |
| Diluted | $1.70 | $1.38 | $5.82 | $4.75 |
| Cash dividends per common share | $0.20 | $0.175 | $0.58 | $0.525 |
| Weighted average common shares outstanding: | | | | |
| Basic | 54,476 | 54,282 | 54,539 | 54,076 |
| Diluted | 54,954 | 55,101 | 55,171 | 55,020 |

(1) Tax expense was $49 and $688 for the three months ended September 30, 2018 and 2017, respectively. Tax expense (benefit) was $2,304 and $(884) for the nine months ended September 30, 2018 and 2017, respectively.
(2) Tax expense (benefit) was $7 and $(312) for the three months ended September 30, 2018 and 2017, respectively. Tax benefit was $(17) and $(315) for the nine months ended September 30, 2018 and 2017, respectively.
(3) Tax expense (benefit) was $17 and $(467) for the three months ended September 30, 2018 and 2017, respectively. Tax (benefit) expense was $(22) and $274 for the nine months ended September 30, 2018 and 2017, respectively.

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

MKS INSTRUMENTS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(in thousands, except per share data)

(Unaudited)

| | Common Stock | | Additional Paid-In | Retained | Accumulated Other Comprehensive | Total Stockholders' |
|---|---|---|---|---|---|---|
| (in thousands, except share data) | Shares | Amount | Capital | Earnings | Income/(Loss) | Equity |
| Balance at June 30, 2018 | 54,787,153 | $ 113 | $ 793,384 | $ 1,004,698 | $ 3,243 | $ 1,801,438 |
| Net issuance under stock-based plans | 15,601 | | (589 ) | | | (589 ) |
| Stock-based compensation | | | 5,213 | | | 5,213 |
| Stock repurchase | (818,131 ) | | (11,870 ) | (63,130 ) | | (75,000 ) |
| Cash dividend | | | | (10,859 ) | | (10,859 ) |
| Accounting Standards Codification Topic 606 adjustment | | | | (27 ) | | (27 ) |
| Comprehensive income (net of tax): | | | | | | |
| Net income | | | | 93,277 | | 93,277 |
| Other comprehensive loss | | | | | (3,160 ) | (3,160 ) |
| Balance at September 30, 2018 | 53,984,623 | $ 113 | $ 786,138 | $ 1,023,959 | $ 83 | $ 1,810,293 |

| | Common Stock | | Additional Paid-In | Retained | Accumulated Other Comprehensive | Total Stockholders' |
|---|---|---|---|---|---|---|
| (in thousands, except share data) | Shares | Amount | Capital | Earnings | Income/(Loss) | Equity |
| Balance at December 31, 2017 | 54,355,535 | $ 113 | $ 789,644 | $ 795,698 | $ 3,452 | $ 1,588,907 |
| Net issuance under stock-based plans | 447,219 | | (13,641 ) | | | (13,641 ) |
| Stock-based compensation | | | 22,005 | | | 22,005 |
| Stock repurchase | (818,131 ) | | (11,870 ) | (63,130 ) | | (75,000 ) |
| Cash dividend | | | | (31,608 ) | | (31,608 ) |
| Accounting Standards Codification Topic 606 adjustment | | | | 1,739 | | 1,739 |
| Comprehensive income (net of tax): | | | | | | |
| Net income | | | | 321,260 | | 321,260 |
| Other comprehensive loss | | | | | (3,369 ) | (3,369 ) |
| Balance at September 30, 2018 | 53,984,623 | $ 113 | $ 786,138 | $ 1,023,959 | $ 83 | $ 1,810,293 |

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

MKS INSTRUMENTS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)

(Unaudited)

| | Nine Months Ended September 30, | |
|---|---|---|
| | 2018 | 2017 |
| Cash flows provided by operating activities: | | |
| Net income | $321,260 | $261,494 |
| Adjustments to reconcile net income to net cash provided by operating activities: | | |
| Depreciation and amortization | 59,906 | 62,550 |
| Amortization of debt issuance costs, original issue discount and soft call premium | 3,784 | 6,385 |
| Asset impairment | — | 6,719 |
| Gain on sale of business | — | (74,856) |
| Stock-based compensation | 22,005 | 19,834 |
| Provision for excess and obsolete inventory | 15,575 | 15,349 |
| Provision for bad debt | 859 | 650 |
| Deferred income taxes | (3,525) | 6,641 |
| Other | 531 | 832 |
| Changes in operating assets and liabilities: | | |
| Trade accounts receivable | (23,125) | (26,489) |
| Inventories | (80,441) | (51,251) |
| Income taxes | (13,874) | 15,646 |
| Other current and non-current assets | (17,652) | (9,714) |
| Accrued compensation | (15,529) | 11,058 |
| Other current and non-current liabilities | 8,934 | 22,517 |
| Accounts payable | (385) | 7,071 |
| Net cash provided by operating activities | 278,323 | 274,436 |
| | | |
| Cash flows (used in) provided by investing activities: | | |
| Net proceeds from sale of business | — | 72,509 |
| Purchases of investments | (213,774) | (199,012) |
| Maturities of investments | 135,339 | 116,779 |
| Sales of investments | 67,868 | 43,571 |
| Purchases of property, plant and equipment | (36,885) | (17,857) |
| Net cash (used in) provided by investing activities | (47,452) | 15,990 |
| | | |
| Cash flows used in financing activities: | | |
| Repurchase of common stock | (75,000) | — |
| Proceeds from short and long-term borrowings | 60,624 | 13,158 |
| Payments on short-term borrowings | (57,865) | (13,277) |
| Payments on long-term borrowings | (50,002) | (178,141) |
| Net payments related to employee stock awards | (13,641) | (14,719) |
| Dividend payments to common stockholders | (31,608) | (28,403) |
| Net cash used in financing activities | (167,492) | (221,382) |

| | | |
|---|---|---|
| Effect of exchange rate changes on cash and cash equivalents | 2,584 | 3,140 |
| Increase in cash and cash equivalents and restricted cash | 65,963 | 72,184 |
| Cash and cash equivalents, including restricted cash, at beginning of period[1] | 333,887 | 233,910 |
| Cash and cash equivalents, including restricted cash, at end of period[2] | $399,850 | $306,094 |

(1) Restricted cash at the beginning of the period was $119 and $5,287 for the nine months ended September 30, 2018 and 2017, respectively.

(2) Restricted cash at the end of the period was $114 and $117 for the nine months ended September 30, 2018 and 2017, respectively.

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

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MKS INSTRUMENTS, INC.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

(in thousands, except share and per share data)

1) Basis of Presentation

The terms "MKS" and the "Company" refer to MKS Instruments, Inc. and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation. The interim financial data as of September 30, 2018, and for the three and nine months ended September 30, 2018 are unaudited; however, in the opinion of MKS, the interim data includes all adjustments, consisting of normal recurring adjustments, necessary for a fair statement of the results for the interim periods. The condensed consolidated balance sheet presented as of December 31, 2017 has been derived from the consolidated audited financial statements as of that date. The unaudited condensed consolidated financial statements presented herein have been prepared in accordance with the instructions to Form 10-Q and do not include all of the information and note disclosures required by United States generally accepted accounting principles ("U.S. GAAP"). The unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto included in the MKS Annual Report on Form 10-K for the year ended December 31, 2017 filed with the Securities and Exchange Commission on February 28, 2018.

The preparation of these unaudited condensed consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent liabilities at the date of the unaudited condensed consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. On an on-going basis, management evaluates its estimates and judgments, including those related to revenue recognition, stock-based compensation, inventory, intangible assets, goodwill and other long-lived assets, warranty liabilities, pension liabilities, acquisition expenses, income taxes and investments. Management bases its estimates and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Reclassification of certain line items in prior period financial statements

The Company has historically recorded the revenue and related cost of revenue for the sale of its spare parts within Products in its Statements of Operations for the Vacuum & Analysis segment. The Company has now determined that these items are better presented within revenue and related cost of revenue within Services for the Vacuum & Analysis segment in its Statements of Operations to align with the current manner in which the Company operates its services business, and has elected to reclassify these amounts in previously issued financial statements as shown below. This change in presentation has no impact on total revenue or total cost of revenue.

| | Three Months Ended September 30, 2017 | | |
|---|---|---|---|
| | As previously reported | Adjustment | As reclassified |
| Net revenues: | | | |
| Products | $434,710 | $ (5,819 ) | $ 428,891 |
| Services | 51,557 | 5,819 | 57,376 |

| | | | |
|---|---|---|---|
| Total net revenues | 486,267 | — | 486,267 |
| Cost of revenues: | | | |
| Cost of products | 225,174 | 1,271 | 226,445 |
| Cost of services | 33,098 | (1,271 ) | 31,827 |
| Total cost of revenues | $258,272 | $ — | $ 258,272 |

| | Nine Months Ended September 30, 2017 | | |
|---|---|---|---|
| | As previously reported | Adjustment | As reclassified |
| Net revenues: | | | |
| Products | $1,259,582 | $ (16,436 ) | $1,243,146 |
| Services | 144,595 | 16,436 | 161,031 |
| Total net revenues | 1,404,177 | — | 1,404,177 |
| Cost of revenues: | | | |
| Cost of products | 659,538 | 3,447 | 662,985 |
| Cost of services | 91,514 | (3,447 ) | 88,067 |
| Total cost of revenues | $751,052 | $ — | $751,052 |

MKS INSTRUMENTS, INC.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

(in thousands, except share and per share data)

2) Recently Issued Accounting Pronouncements

In March 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2018-05, "Income Taxes (Topic 740)." This standard is an amendment that adopts the language of Securities and Exchange Commission Staff Accounting Bulletin No. 118 ("SAB 118") and aims to address certain circumstances that may arise for registrants in accounting for the income tax effects of the Tax Cuts and Jobs Act (the "Act") and to address any uncertainty or diversity of views in practice regarding the application of Topic 740 in situations where a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting under Topic 740 for certain income tax effects of the Act for the reporting period in which the Act was enacted. The provisions of this ASU were applied to the Company's December 31, 2017 financial statements. The Company recorded provisional amounts with respect to the Act under SAB 118 at December 31, 2017 and September 30, 2018 and needs to complete additional analysis and receive additional guidance from the U.S. Internal Revenue Service with respect to provisions of the Act that affect the Company before the provisional determinations become final. Until the Company completes its analysis and receives additional guidance, the Company is not able to determine if the impact of ASU 2018-05 is material to the Company's consolidated financial statements in any period.

In August 2017, the FASB issued ASU 2017-12, "Derivatives and Hedging (Topic 815)." This standard better aligns an entity's risk management activities and financial reporting for hedging relationships through changes to both the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results. The provisions of this ASU are effective for annual periods beginning after December 15, 2018, including interim periods within those fiscal years. The Company does not expect adoption of this ASU to have a material impact on the Company's consolidated financial statements.

In May 2017, the FASB issued ASU 2017-09, "Compensation-Stock Compensation (Topic 718)-Scope of Modification Accounting." This standard provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. The provisions of this ASU are effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In March 2017, the FASB issued ASU 2017-07, "Compensation-Retirement Benefits (Topic 715)-Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost." This standard requires that an employer disaggregate the service cost component from the other components of net benefit cost. This standard also provides explicit guidance on how to present the service cost component and the other components of the net benefit cost in the income statement and allows only the service cost component of net benefit cost to be eligible for capitalization. The provisions of this ASU are effective for annual periods beginning after December 31, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU 2017-01, "Business Combinations (Topic 805)-Clarifying the Definition of a Business." This standard clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses.

This standard also provides a more robust framework to use in determining when a set of assets and activities is a business. Because the current definition of a business is interpreted broadly and can be difficult to apply, stakeholders indicated that analyzing transactions is inefficient and costly and that the definition does not permit the use of reasonable judgment. The provisions of this ASU are effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In November 2016, the FASB issued ASU 2016-18, "Statement of Cash Flows (Topic 230)-Restricted Cash," an amendment to ASU 2016-15. This standard requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents and amounts generally described as restricted cash and restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The provisions of this ASU are effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years and should be applied at the time of adoption of ASU 2016-15. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

MKS INSTRUMENTS, INC.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

(in thousands, except share and per share data)

In October 2016, the FASB issued ASU 2016-16, "Income Taxes (Topic 740)-Intra-Entity Transfer of Assets Other Than Inventory." This standard requires that an entity recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs as opposed to when the assets have been sold to an outside party. The provisions of this ASU are effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, "Statement of Cash Flows (Topic 230)-Classification of Certain Cash Receipts and Cash Payments." This standard addresses eight specific cash flow issues with the objective of addressing the diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows under Topic 230. The provisions of this ASU are effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)." This standard requires the recognition of lease assets and liabilities for all leases, with certain exceptions, on the balance sheet. In transition, lessees and lessors have the option to either apply the standard retrospectively through a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption or they can apply the new standard to comparative periods presented. This ASU is effective for annual periods beginning after December 15, 2018, including interim periods within those fiscal years. The FASB issued additional updates to the new standard in Topic 842 (Update 2018-01 in January 2018 – Land Easement Practical Expedient for Transition to Topic 842, Update 2018-10 – Codification Improvements to Topic 842 and Update 2018-11 in July 2018 – Targeted Improvements). The Company has reviewed the requirements of this standard and has formulated a plan for implementation. The management team has communicated its approach to the Audit Committee and will provide regular updates as appropriate. The Company is currently accumulating details on the population of leases and entering these details into a selected software database, which will be a repository and accounting solution for reporting and disclosure requirements required by the standard. The Company will continue to assess and disclose the impact that this ASU will have on its consolidated financial statements, disclosures and related controls, when known.

In January 2016, the FASB issued ASU 2016-01, "Financial Instruments-Overall (Subtopic 825-10)-Recognition and Measurement of Financial Assets and Financial Liabilities." This ASU provides guidance for the recognition, measurement, presentation, and disclosure of financial instruments. The new standard revises accounting related to equity investments and the presentation of certain fair value changes for financial assets and liabilities measured at fair value. Among other things, it amends the presentation and disclosure requirements of equity securities that do not result in consolidation and are not accounted for under the equity method. Changes in the fair value of these equity securities will be recognized directly in net income. This standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted this ASU during the three month period ended March 31, 2018. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers (Topic 606)” (“ASC 606”). This ASU provides for a single comprehensive model to use in accounting for revenue arising from contracts with customers and has replaced most existing revenue recognition guidance in GAAP. This ASU is effective for fiscal years and interim periods within those years beginning after December 15, 2017. The two permitted transition methods under the new standard are the full retrospective method, in which case the standard would be applied to each prior reporting period presented, or the modified retrospective method, in which case the cumulative effect of applying the standard would be recognized at the date of initial application. The Company used the modified retrospective method upon adoption in the first quarter of 2018. The FASB issued additional updates to the new revenue standard in Topic 606 relating to reporting revenue on a gross versus net basis (Update 2016-08 in March 2016), identifying performance obligations and licensing arrangements (Update 2016-10 in April 2016), narrow-scope improvements and practical expedients (Update 2016-12 in May 2016), technical corrections and improvements (Update 2016-20 in December 2016), and SEC Updates (Update 2017-13 in September 2017 and Update 2017-14 in November 2017). The adoption of this ASU did not have a material impact on the Company’s consolidated financial statements as described further in Note 3.

MKS INSTRUMENTS, INC.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

(in thousands, except share and per share data)

3) Revenue from Contracts with Customers

The Company adopted Accounting Standards Codification ASC 606 ("ASC 606") on January 1, 2018 using the modified retrospective method for all contracts not completed as of the date of adoption. The reported results for the nine months ended September 30, 2018 reflect the application of ASC 606 guidance while the reported results for 2017 were prepared under the guidance of Accounting Standards Codification 605, Revenue Recognition.

The Company has recorded a net increase to opening retained earnings of $1,809 as of January 1, 2018 due to the cumulative impact of adopting ASC 606, with the impact primarily related to its service business and certain custom products. The impact to revenue for the quarter ended September 30, 2018 as a result of applying ASC 606 was immaterial.

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

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

Revenue under ASC 606 is recognized when or as obligations under the terms of a contract with the Company's customer has been satisfied and control has transferred to the customer. The majority of the Company's performance obligations, and associated revenue, are transferred to customers at a point in time, generally upon shipment of a product to the customer or receipt of the product by the customer and without significant judgments. Installation services are not significant and are usually completed in a short period of time (normally less than two weeks) and therefore, recorded at a point in time when the installation services are completed, rather than over time as they are not material. Extended warranty, service contracts, and repair services, which are transferred to the customer over time, are recorded as revenue as the services are performed. For repair services, the Company makes an accrual at quarter end based upon historical repair times within its product groups to record revenue based upon the estimated number of days completed to date, which is consistent with ratable recognition. Customized products with no alternative future use to the Company, and that have an enforceable right to payment for performance completed to date, are also recorded over time. The Company considers this to be a faithful depiction of the transfer to the customer of revenue over time as the work is performed or service is delivered, ratably over time.

Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring goods or providing services. Performance obligations promised in a contract are identified based on the products or services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the product or service either on its own or together with other resources that are readily available from third parties or from the Company, and are distinct in the context of the contract, whereby the transfer of the product or service is separately identifiable from other promises in the contract. Sales, value add, and other taxes the Company collects concurrent with revenue-producing activities are excluded from revenue. The Company's normal payment terms are 30 to 60 days but vary by the type and location of its customers and the products or services offered. The time between invoicing and when payment is due is not significant. For certain products and services and customer

types, the Company requires payment before the products or services are delivered to, or performed for, the customer. None of the Company's contracts as of September 30, 2018 contained a significant financing component. Contract assets as of January 1 and September 30, 2018 were $3,065 and $3,951, respectively, and included in other current assets.

Contracts with Multiple Performance Obligations

The Company periodically enters into contracts with its customers in which a customer may purchase a combination of goods and or services, such as products with installation services or extended warranty obligations. These contracts include multiple promises that the Company evaluates to determine if the promises are separate performance obligations. Once the Company determines the performance obligations, the Company then determines the transaction price, which includes estimating the amount of variable consideration to be included in the transaction price, if any. To the extent the transaction price includes variable consideration, the Company estimates the amount of variable consideration that should be included in the transaction price utilizing either the expected value method or the most likely amount method depending on the method the Company expects to better predict the amount of consideration to which it will be entitled. There are no constraints on the variable

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consideration recorded. The Company then allocates the transaction price to each performance obligation in the contract based on a relative stand-alone selling price charged separately to customers or using an expected cost plus margin method. The corresponding revenues are recognized when or as the related performance obligations are satisfied, which are noted above. The impact of variable consideration was immaterial during the three and nine months ended September 30, 2018.

Deferred Revenues

The Company's standard assurance warranty period is normally 12 to 24 months. The Company sells separately-priced service contracts and extended warranty contracts related to certain of its products, especially its laser products. The separately priced contracts generally range from 12 to 60 months. The Company normally receives payment at the inception of the contract and recognizes revenue over the term of the agreement in proportion to the costs expected to be incurred in satisfying the obligations under the contract. The Company has elected to use the practical expedient related to disclosing the remaining performance obligations as of September 30, 2018, as the majority have a duration of less than one year.

A rollforward of the Company's deferred revenue is as follows:

| | Nine Months Ended September 30, 2018 |
|---|---|
| Beginning balance, January 1[1] | $ 14,448 |
| Amount of deferred revenue recognized in income | (15,846) |
| Additions to deferred revenue | 13,869 |
| Ending balance, September 30[2] | $ 12,471 |

[1] Beginning deferred revenue as of January 1, 2018 included $11,322 of current deferred revenue and $3,126 of long-term deferred revenue.

[2] Ending deferred revenue as of September 30, 2018 included $9,136 of current deferred revenue and $3,335 of long-term deferred revenue.

Costs to Obtain and Fulfill a Contract

Under ASC 606, the Company expenses sales commissions when incurred because the amortization period would have been one year or less. These costs are recorded within selling, general and administration expenses. The Company has elected to recognize the costs for freight and shipping when control over products has transferred to the customer as an expense in cost of sales.

The Company monitors and tracks the amount of product returns and reduces revenue at the time of shipment for the estimated amount of future returns, based on historical experience. The Company makes estimates evaluating its allowance for doubtful accounts. The Company continuously monitors collections and payments from its customers and maintains a provision for estimated credit losses based upon its historical experience and any specific customer collection issues that it has identified.

Disaggregation of Revenue

The following table summarizes revenue from contracts with customers:

| | Three Months Ended September 30, 2018 | | |
|---|---|---|---|
| | Vacuum & Analysis | Light & Motion | Total |
| Net revenues: | | | |
| Products | $239,924 | $186,331 | $426,255 |
| Services | 46,114 | 14,783 | 60,897 |
| Total net revenues | $286,038 | $201,114 | $487,152 |

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| | Three Months Ended September 30, 2017 | | |
|---|---|---|---|
| | Vacuum & Analysis | Light & Motion | Total |
| Net revenues: | | | |
| Products | $265,136 | $163,755 | $428,891 |
| Services | 43,133 | 14,243 | 57,376 |
| Total net revenues | $308,269 | $177,998 | $486,267 |

| | Nine Months Ended September 30, 2018 | | |
|---|---|---|---|
| | Vacuum & Analysis | Light & Motion | Total |
| Net revenues: | | | |
| Products | $865,714 | $567,217 | $1,432,931 |
| Services | 136,996 | 44,640 | 181,636 |
| Total net revenues | $1,002,710 | $611,857 | $1,614,567 |

| | Nine Months Ended September 30, 2017 | | |
|---|---|---|---|
| | Vacuum & Analysis | Light & Motion | Total |
| Net revenues: | | | |
| Products | $776,256 | 466,890 | $1,243,146 |
| Services | 119,958 | 41,073 | 161,031 |
| Total net revenues | $896,214 | $507,963 | $1,404,177 |

Product revenue, excluding revenue from certain custom products, is recorded at a point in time, while the majority of the service revenue and revenue from certain custom products is recorded over time.

Refer to Note 17 in the financial statements for revenue by reportable segment, geography and groupings of similar products.

4) Investments

The fair value of investments classified as short-term consists of the following:

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Available-for-sale investments: | | |
| Time deposits and certificates of deposit | $ 14,552 | $ 9,757 |
| Bankers' acceptance drafts | 2,107 | 5,330 |
| Asset-backed securities | 38,947 | 36,990 |
| Commercial paper | 32,057 | 13,750 |
| Corporate obligations | 71,971 | 77,821 |
| Municipal bonds | 1,288 | 1,970 |
| U.S. treasury obligations | 28,208 | 28,078 |
| U.S. agency obligations | 30,646 | 35,738 |
| | $ 219,776 | $ 209,434 |

Investments classified as long-term consist of the following:

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Available-for-sale investments: | | |
| Group insurance contracts | $ 6,004 | $ 6,255 |
| Cost method investments: | | |
| Minority interest in a private company | 4,400 | 4,400 |
| | $ 10,404 | $ 10,655 |

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The following tables show the gross unrealized gains and (losses) aggregated by investment category for available-for-sale investments:

| As of September 30, 2018: | Cost | Gross Unrealized Gains | Gross Unrealized (Losses) | Estimated Fair Value |
|---|---|---|---|---|
| Short-term investments: | | | | |
| Available-for-sale investments: | | | | |
| Time deposits and certificates of deposit | $14,552 | $ — | $ — | $14,552 |
| Bankers' acceptance drafts | 2,107 | — | — | 2,107 |
| Asset-backed securities | 38,961 | 11 | (25) | 38,947 |
| Commercial paper | 32,238 | — | (181) | 32,057 |
| Corporate obligations | 71,931 | 59 | (19) | 71,971 |
| Municipal bonds | 1,290 | — | (2) | 1,288 |
| U.S. treasury obligations | 28,200 | 10 | (2) | 28,208 |
| U.S. agency obligations | 30,649 | 4 | (7) | 30,646 |
| | $219,928 | $ 84 | $ (236) | $219,776 |

| As of September 30, 2018: | Cost | Gross Unrealized Gains | Gross Unrealized (Losses) | Estimated Fair Value |
|---|---|---|---|---|
| Long-term investments: | | | | |
| Available-for-sale investments: | | | | |
| Group insurance contracts | $6,010 | $ — | $ (6) | $ 6,004 |

| As of December 31, 2017: | Cost | Gross Unrealized Gains | Gross Unrealized (Losses) | Estimated Fair Value |
|---|---|---|---|---|
| Short-term investments: | | | | |
| Available-for-sale investments: | | | | |
| Time deposits and certificates of deposit | $9,756 | $ 1 | $ — | $9,757 |
| Bankers acceptance drafts | 5,330 | — | — | 5,330 |
| Asset-backed securities | 37,017 | 15 | (42) | 36,990 |

| | | | | |
|---|---|---|---|---|
| Commercial paper | 13,810 | — | (60) | 13,750 |
| Corporate obligations | 77,788 | 58 | (25) | 77,821 |
| Municipal bonds | 1,970 | — | — | 1,970 |
| U.S. treasury obligations | 28,054 | 24 | — | 28,078 |
| U.S. agency obligations | 35,728 | 10 | — | 35,738 |
| | $209,453 | $ 108 | $ (127) | $209,434 |

| As of December 31, 2017: | Cost | Gross Unrealized Gains | Gross Unrealized (Losses) | Estimated Fair Value |
|---|---|---|---|---|
| Long-term investments: | | | | |
| Available-for-sale investments: | | | | |
| Group insurance contracts | $6,006 | $ 249 | $ — | $ 6,255 |

The tables above, which show the gross unrealized gains and (losses) aggregated by investment category for available-for-sale investments as of September 30, 2018 and December 31, 2017, reflect the inclusion within short-term investments of investments with contractual maturities greater than one year from the date of purchase. Management has the ability, if necessary, to liquidate any of its investments in order to meet the Company's liquidity needs in the next 12 months. Accordingly, those investments with contractual maturities greater than one year from the date of purchase are classified as short-term on the accompanying balance sheets.

The Company reviews and evaluates its investments for any indication of possible impairment. Based on this review, the Company has determined that the unrealized losses related to these investments at September 30, 2018 and December 31, 2017 were temporary.

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Interest income is accrued as earned. Dividend income is recognized as income on the date the stock trades "ex-dividend." The cost of marketable securities sold is determined by the specific identification method. Realized gains or losses are reflected in income and were not material for the nine months ended September 30, 2018 and 2017.

5) Fair Value Measurements

In accordance with the provisions of fair value accounting, a fair value measurement assumes that the transaction to sell an asset or transfer a liability occurs in the principal market for the asset or liability or, in the absence of a principal market, the most advantageous market for the asset or liability and defines fair value based upon an exit price model.

The fair value measurement guidance establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The guidance describes three levels of inputs that may be used to measure fair value:

| | |
|---|---|
| Level 1 | Quoted prices in active markets for identical assets or liabilities assessed as of the reporting date. Active markets are those in which transactions for the asset or liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis. |
| Level 2 | Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 2 assets and liabilities include debt securities with quoted prices that are traded less frequently than exchange-traded instruments or securities or derivative contracts that are valued using a pricing model with inputs that are observable in the market or can be derived principally from or corroborated by observable market data. |
| Level 3 | Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. Level 3 assets and liabilities include financial instruments whose value is determined using pricing models, discounted cash flow methodologies, or similar techniques, as well as instruments for which the determination of fair value requires significant management judgment or estimation. |

In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, the Company categorizes such assets and liabilities based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability.

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Assets and liabilities of the Company are measured at fair value on a recurring basis as of September 30, 2018 and are summarized as follows:

| | | Fair Value Measurements at Reporting Date Using | | |
|---|---|---|---|---|
| Description | September 30, 2018 | Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| Assets: | | | | |
| Cash equivalents: | | | | |
| Money market funds | $ 17,584 | $17,584 | $ — | $ — |
| Commercial paper | 13,283 | — | 13,283 | — |
| Corporate obligations | 4,373 | — | 4,373 | — |
| U.S. agency obligations | 2,244 | — | 2,244 | — |
| Restricted cash – money market funds | 114 | 114 | — | — |
| Available-for-sale investments: | | | | |
| Time deposits and certificates of deposit | 14,552 | — | 14,552 | — |
| Bankers acceptance drafts | 2,107 | — | 2,107 | — |
| Asset-backed securities | 38,947 | — | 38,947 | — |
| Commercial paper | 32,057 | — | 32,057 | — |
| Corporate obligations | 71,971 | — | 71,971 | — |
| Municipal bonds | 1,288 | — | 1,288 | — |
| U.S. treasury obligations | 28,208 | — | 28,208 | — |
| U.S. agency obligations | 30,646 | — | 30,646 | — |
| Group insurance contracts | 6,004 | — | 6,004 | — |
| Derivatives – foreign exchange contracts | 3,434 | — | 3,434 | — |
| Funds in investments and other assets: | | | | |
| Israeli pension assets | 15,815 | — | 15,815 | — |
| Derivatives – interest rate hedge – non-current | 8,539 | — | 8,539 | — |
| Total assets | $ 291,166 | $17,698 | $ 273,468 | $ — |
| Liabilities: | | | | |
| Derivatives – foreign exchange contracts | $ 343 | $— | $ 343 | $ — |

Reported as follows:

| | | | | |
|---|---|---|---|---|
| Assets: | | | | |
| Cash and cash equivalents, including restricted cash[1] | $ 37,598 | $17,698 | $ 19,900 | $ — |
| Short-term investments | 219,776 | — | 219,776 | — |
| Other current assets | 3,434 | — | 3,434 | — |
| Total current assets | $ 260,808 | $17,698 | $ 243,110 | $ — |
| Long-term investments[2] | $ 6,004 | $— | $ 6,004 | $ — |
| Other assets | 24,354 | — | 24,354 | — |
| Total long-term assets | $ 30,358 | $— | $ 30,358 | $ — |
| Liabilities: | | | | |
| Other current liabilities | $ 343 | $— | $ 343 | $ — |

(1) The cash and cash equivalent amounts presented in the table above do not include cash of $362,252 as of September 30, 2018.

(2) The long-term investments presented in the table above do not include the Company’s minority interest investment in a private company, which is accounted for under the cost method.

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Assets and liabilities of the Company are measured at fair value on a recurring basis as of December 31, 2017 and are summarized as follows:

| | | Fair Value Measurements at Reporting Date Using | | |
|---|---|---|---|---|
| Description | December 31, 2017 | Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| Assets: | | | | |
| Cash equivalents: | | | | |
| Money market funds | $ 4,987 | $4,987 | $ — | $ — |
| Time deposits and certificates of deposit | 2,100 | — | 2,100 | — |
| Commercial paper | 30,475 | — | 30,475 | — |
| Restricted cash – money market funds | 119 | 119 | — | — |
| Available-for-sale investments: | | | | |
| Time deposits and certificates of deposit | 9,757 | — | 9,757 | — |
| Bankers acceptance drafts | 5,330 | — | 5,330 | — |
| Asset-backed securities | 36,990 | — | 36,990 | — |
| Commercial paper | 13,750 | — | 13,750 | — |
| Corporate obligations | 77,821 | — | 77,821 | — |
| Municipal bonds | 1,970 | — | 1,970 | — |
| U.S. treasury obligations | 28,078 | — | 28,078 | — |
| U.S. agency obligations | 35,738 | — | 35,738 | — |
| Group insurance contracts | 6,255 | — | 6,255 | — |
| Derivatives – foreign exchange contracts | 168 | — | 168 | — |
| Funds in investments and other assets: | | | | |
| Israeli pension assets | 15,048 | — | 15,048 | — |
| Derivatives – interest rate hedge – non-current | 6,179 | — | 6,179 | — |
| Total assets | $ 274,765 | $5,106 | $ 269,659 | $ — |
| Liabilities: | | | | |
| Derivatives – foreign exchange contracts | $ 6,198 | $— | $ 6,198 | $ — |
| Assets: | | | | |
| Cash and cash equivalents, including restricted cash[(1)] | $ 37,681 | $5,106 | $ 32,575 | $ — |
| Short-term investments | 209,434 | — | 209,434 | — |

| | | | | |
|---|---|---|---|---|
| Other current assets | 168 | — | 168 | — |
| Total current assets | $ 247,283 | $5,106 | $ 242,177 | $ — |
| Long-term investments[2] | $ 6,255 | $— | $ 6,255 | $ — |
| Other assets | 21,227 | — | 21,227 | — |
| Total long-term assets | $ 27,482 | $— | $ 27,482 | $ — |
| Liabilities: | | | | |
| Other current liabilities | $ 6,198 | $— | $ 6,198 | $ — |

[1] The cash and cash equivalent amounts presented in the table above do not include cash of $292,808 and non-negotiable time deposits of $3,398 as of December 31, 2017.

[2] The long-term investments presented in the table above do not include the Company's minority interest investment in a private company, which is accounted for under the cost method.

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Money Market Funds

Money market funds are cash and cash equivalents and are classified within Level 1 of the fair value hierarchy.

Available-For-Sale Investments

Available-for-sale investments consisted of time deposits and drafts, certificates of deposit, bankers acceptance drafts, asset-backed securities (which include auto loans, credit card receivables and equipment trust receivables), commercial paper, corporate obligations, municipal bonds, U.S. treasury obligations, U.S. agency obligations and group insurance contracts.

The Company measures its debt and equity investments at fair value. The Company’s available-for-sale investments are classified within Level 2 of the fair value hierarchy.

Israeli Pension Assets

Israeli pension assets represent investments in mutual funds, government securities and other time deposits. These investments are set aside for the retirement benefit of the employees at the Company’s Israeli subsidiaries. These funds are classified within Level 2 of the fair value hierarchy.

Derivatives

As a result of the Company’s global operating activities, the Company is exposed to market risks from changes in foreign currency exchange rates and variable interest rates, which may adversely affect its operating results and financial position. When deemed appropriate, the Company minimizes its risks from foreign currency exchange rate and interest rate fluctuations through the use of derivative financial instruments. The principal market in which the Company executes its foreign currency contracts and interest rate swaps is the institutional market in an over-the-counter environment with a relatively high level of price transparency. The market participants usually are large commercial banks. The forward foreign currency exchange contracts and interest rate hedge are valued using broker quotations or market transactions and are classified within Level 2 of the fair value hierarchy.

6) Derivatives

The Company enters into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments and those utilized as economic hedges. The Company operates internationally and, in the normal course of business, is exposed to fluctuations in interest rates and foreign exchange rates. These fluctuations can increase the costs of financing, investing and operating the business. The Company has used derivative instruments, such as forward foreign currency exchange contracts, to manage certain foreign currency exposure, and interest rate swaps to manage interest rate exposure.

By nature, all financial instruments involve market and credit risks. The Company enters into derivative instruments with major investment grade financial institutions, for which no collateral is required. The Company has policies to monitor the credit risk of these counterparties. While there can be no assurance, the Company does not anticipate any material non-performance by any of these counterparties.

Interest Rate Swap Agreement

On September 30, 2016, the Company entered into an interest rate swap agreement to fix the rate on approximately 50% of its then-outstanding balance under the Credit Agreement, as described further in Note 10. This hedge fixes the interest rate paid on the hedged debt at 1.198% per annum plus the applicable credit spread, which was 1.75% as of September 30, 2018, through September 30, 2020. The interest rate swap is recorded at fair value on the balance sheet and changes in the fair value are recognized in other comprehensive income (loss) (“OCI”). To the extent that this arrangement is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded currently in earnings in the period it occurs. The notional amount of this transaction was $290,000 and had a fair value of $8,539 at September 30, 2018. The notional amount of this transaction was $305,000 and had a fair value of $6,179 at December 31, 2017.

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Foreign Exchange Contracts

The Company hedges a portion of its forecasted foreign currency-denominated intercompany sales of inventory, over a maximum period of eighteen months, using forward foreign exchange contracts accounted for as cash-flow hedges related to Japanese, South Korean, British, Euro and Taiwanese currencies. To the extent these derivatives are effective in off-setting the variability of the hedged cash flows, and otherwise meet the hedge accounting criteria, changes in the derivatives' fair value are not included in current earnings but are included in OCI in stockholders' equity. These changes in fair value will subsequently be reclassified into earnings, as applicable, when the forecasted transaction occurs. To the extent that a previously designated hedging transaction is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded currently in earnings in the period it occurs. The cash flows resulting from forward exchange contracts are classified in the consolidated statements of cash flows as part of cash flows from operating activities. The Company does not enter into derivative instruments for trading or speculative purposes.

As of September 30, 2018 and December 31, 2017, the Company had outstanding forward foreign exchange contracts with gross notional values of $149,088 and $208,922, respectively. The following tables provide a summary of the primary net hedging positions and corresponding fair values held as of September 30, 2018 and December 31, 2017:

| | September 30, 2018 | |
|---|---|---|
| Currency Hedged (Buy/Sell) | Gross Notional Value | Fair Value[1] |
| U.S. Dollar/Japanese Yen | $40,004 | $ 1,143 |
| U.S. Dollar/South Korean Won | 56,628 | 759 |
| U.S. Dollar/Euro | 23,678 | 612 |
| U.S. Dollar/U.K. Pound Sterling | 10,001 | 314 |
| U.S. Dollar/Taiwan Dollar | 18,777 | 263 |
| Total | $149,088 | $ 3,091 |

| | December 31, 2017 | |
|---|---|---|
| Currency Hedged (Buy/Sell) | Gross Notional Value | Fair Value[1] |
| U.S. Dollar/Japanese Yen | $70,175 | $ (233 ) |
| U.S. Dollar/South Korean Won | 79,672 | (3,799 ) |
| U.S. Dollar/Euro | 26,140 | (1,047 ) |
| U.S. Dollar/U.K. Pound Sterling | 12,104 | (337 ) |
| U.S. Dollar/Taiwan Dollar | 20,831 | (614 ) |
| Total | $208,922 | $ (6,030 ) |

[1] Represents the receivable (payable) amount included in the consolidated balance sheet.

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The following table provides a summary of the fair value amounts of the Company's derivative instruments:

| Derivatives Designated as Hedging Instruments | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Derivative assets: | | |
| Foreign exchange contracts[1] | $ 3,434 | $ 168 |
| Foreign currency interest rate hedge[2] | 8,539 | 6,179 |
| Derivative liabilities: | | |
| Foreign exchange contracts[1] | (343 ) | (6,198 ) |
| Total net derivative asset designated as hedging instruments | $ 11,630 | $ 149 |

[1] The derivative asset of $3,434 and $168 as of September 30, 2018 and December 31, 2017, respectively, related to foreign exchange contracts and is classified in other current assets in the consolidated balance sheet. The derivative liability of $(343) and $(6,198) as of September 30, 2018 and December 31, 2017, respectively, is classified in other current liabilities in the consolidated balance sheet. These foreign exchange contracts are subject to a master netting agreement with one financial institution. However, the Company has elected to record these contracts on a gross basis in the balance sheet.

[2] The interest rate hedge assets of $8,539 and $6,179 as of September 30, 2018 and December 31, 2017, respectively, are classified in other assets in the consolidated balance sheet.

The net amount of existing gains as of September 30, 2018 that the Company expects to reclassify from OCI into earnings within the next twelve months is immaterial.

The following table provides a summary of the gains (losses) on derivatives designated as cash flow hedging instruments:

| | Three Months Ended | | Nine Months Ended | |
|---|---|---|---|---|
| | September 30, | | September 30, | |
| Derivatives Designated as Cash Flow Hedging Instruments | 2018 | 2017 | 2018 | 2017 |
| Forward exchange contracts: | | | | |
| Net gain (loss) recognized in OCI[1] | $212 | $(220 ) | $10,357 | $(4,462) |
| Net gain (loss) reclassified from accumulated OCI into income[2] | $306 | $(1,360) | $(4,882 ) | $(1,842) |

[1] Net change in the fair value of the effective portion classified in OCI.

[2] Effective portion classified in cost of products for the three and nine months ended September 30, 2018 and 2017. The tax effect of the gains or losses reclassified from accumulated OCI into income is immaterial.

The following table provides a summary of the (losses) gains on derivatives not designated as hedging instruments:

| Derivatives Not Designated as Hedging Instruments | Three Months Ended September 30, 2018 | 2017 | Nine Months Ended September 30, 2018 | 2017 |
|---|---|---|---|---|
| Forward exchange contracts: | | | | |
| Net (loss) gain recognized in income[1] | $(111) | $(877) | $12 | $(2,559) |

[1] The Company enters into foreign exchange contracts to hedge against changes in the balance sheet for certain subsidiaries to mitigate the risk associated with certain foreign currency transactions in the ordinary course of business. These derivatives are not designated as hedging instruments and gains or losses from these derivatives are recorded immediately in other (expense) income.

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7) Inventories, net

Inventories consist of the following:

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Raw materials | $ 237,547 | $ 191,351 |
| Work-in-process | 66,635 | 54,050 |
| Finished goods | 94,895 | 93,680 |
| | $ 399,077 | $ 339,081 |

8) Dispositions

Sale of Data Analytics Solutions

In April 2017, the Company completed the sale of its Data Analytics Solutions business for total proceeds of $72,509, net of cash sold and recorded a gain of $74,856. This business, which had revenues in 2016 of $12,700 and was included in the Vacuum & Analysis segment, was no longer a part of the Company’s long-term strategic objectives.

The business did not qualify as a discontinued operation as this sale did not represent a strategic shift in the Company’s business, nor did the sale have a major effect on the Company’s operations. Therefore, the results of operations for all periods are included in the Company’s income from operations. The assets and liabilities of this business have not been reclassified or segregated in the consolidated balance sheet or consolidated statements of cash flows as the amounts were immaterial.

9) Goodwill and Intangible Assets

Goodwill

The Company’s methodology for allocating the purchase price relating to purchase acquisitions is determined through established and generally accepted valuation techniques. Goodwill is measured as the excess of the cost of the acquisition over the sum of the amounts assigned to tangible and identifiable intangible assets acquired less liabilities assumed. The Company assigns assets acquired (including goodwill) and liabilities assumed to one or more reporting units as of the date of acquisition. Typically acquisitions relate to a single reporting unit and thus do not require the allocation of goodwill to multiple reporting units. If the products obtained in an acquisition are assigned to multiple reporting units, the goodwill is distributed to the respective reporting units as part of the purchase price allocation process.

Goodwill and purchased intangible assets with indefinite useful lives are not amortized, but are reviewed for impairment annually during the fourth quarter of each fiscal year and whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. The process of evaluating the potential impairment of goodwill and intangible assets requires significant judgment. The Company regularly monitors current business conditions and other factors including, but not limited to, adverse industry or economic trends, restructuring actions

and lower projections of profitability that may impact future operating results.

Effective July 1, 2018, the Company reassigned goodwill to certain reporting units within the Light & Motion reportable segment resulting from a reorganization of the composition of goodwill reporting units. The goodwill was reassigned to the reporting units affected using the relative fair value approach. In conjunction with this goodwill reassignment, the Company performed an interim quantitative impairment test as of July 1, 2018 for all of its reporting units and concluded that the fair values of each reporting unit exceeded their respective carrying values.

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The changes in the carrying amount of goodwill and accumulated impairment loss during the nine months ended September 30, 2018 and year ended December 31, 2017 were as follows:

| | Nine Months Ended September 30, 2018 | | | Twelve Months Ended December 31, 2017 | | |
|---|---|---|---|---|---|---|
| | Gross Carrying Amount | Accumulated Impairment Loss | Net | Gross Carrying Amount | Accumulated Impairment Loss | Net |
| Beginning balance at January 1 | $735,323 | $ (144,276) | $591,047 | $727,999 | $ (139,414) | $588,585 |
| Sale of business[1] | — | — | — | (3,115) | — | (3,115) |
| Impairment loss[2] | — | — | — | — | (4,862) | (4,862) |
| Foreign currency translation | (3,186) | — | (3,186) | 10,439 | — | 10,439 |
| Ending balance at September 30, 2018 and December 31, 2017 | $732,137 | $ (144,276) | $587,861 | $735,323 | $ (144,276) | $591,047 |

[1] In 2017, the Company sold its Data Analytics Solutions business and, as a result, charged the related goodwill of $(3,115) to the gain on sale of business.

[2] In 2017, the Company recorded an impairment loss of $(4,862) related to the write-off of goodwill related to the discontinuation of a product line and consolidation of two manufacturing plants.

Intangible Assets

Components of the Company's intangible assets are comprised of the following:

| As of September 30, 2018: | Gross | Impairment Charges[1] | Accumulated Amortization | Foreign Currency Translation | Net |
|---|---|---|---|---|---|
| Completed technology | $172,431 | $ (105) | $ (131,840) | $ — | $40,486 |
| Customer relationships | 282,744 | (1,406) | (59,260) | 174 | 222,252 |
| Patents, trademarks, trade names and other | 110,523 | — | (41,970) | (3) | 68,550 |
| | $565,698 | $ (1,511) | $ (233,070) | $ 171 | $331,288 |

| As of December 31, 2017: | Gross | Impairment | Accumulated | Foreign | Net |
|---|---|---|---|---|---|

| | | Charges[1] | Amortization | Currency Translation | |
|---|---|---|---|---|---|
| Completed technology | $172,431 | $ (105 ) | $ (115,371 ) | $ 333 | $57,288 |
| Customer relationships | 282,744 | (1,406 ) | (45,518 ) | 1,571 | 237,391 |
| Patents, trademarks, trade names and other | 110,523 | — | (38,730 ) | (74 ) | 71,719 |
| | $565,698 | $ (1,511 ) | $ (199,619 ) | $ 1,830 | $366,398 |

[1] In 2017, the Company recorded impairment charges of $1,511 related to the write-off of intangible assets as a result of the discontinuation of a product line and consolidation of two manufacturing plants.

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Aggregate amortization expense related to acquired intangibles for the nine months ended September 30, 2018 and 2017 was $32,786 and $34,946, respectively. The amortization expense for the nine months ended September 30, 2018 and 2017 is net of $665 and $588, respectively, of amortization income from unfavorable lease commitments. Aggregate net amortization expense related to acquired intangible assets and unfavorable lease commitments for future years is as follows:

| Year | Amount |
|---|---|
| 2018 (remaining) | $10,760 |
| 2019 | $40,144 |
| 2020 | $28,125 |
| 2021 | $20,248 |
| 2022 | $17,619 |
| 2023 | $17,253 |
| Thereafter | $138,955 |

10) Debt

Term Loan Credit Agreement

In connection with the completion of the Company’s acquisition of Newport Corporation (“Newport”) in April 2016 (the “Newport Merger”), the Company entered into a term loan credit agreement (the “Credit Agreement”) with Barclays Bank PLC, as administrative agent and collateral agent, and the lenders from time to time party thereto (the “Lenders”), that provided senior secured financing of $780,000, subject to increase at the Company’s option in accordance with the Credit Agreement (the “Term Loan Facility”). Borrowings under the Term Loan Facility bear interest per annum at one of the following rates selected by the Company: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the “prime rate” quoted in The Wall Street Journal, (3) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00%, and (4) a floor of 1.75%, plus, in each case, an applicable margin; or (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, subject to a LIBOR rate floor of 0.75%, plus an applicable margin. The Company has elected the interest rate as described in clause (b). The Credit Agreement provides that all loans will be determined by reference to the Base Rate if the LIBOR rate cannot be ascertained, if regulators impose material restrictions on the authority of a lender to make LIBOR rate loans, or for other reasons. The Term Loan Facility was issued with original issue discount of 1.00% of the principal amount thereof.

On June 9, 2016, the Company entered into Amendment No. 1 (the “Repricing Amendment 1”) to the Credit Agreement by and among the Company, the Lenders and Barclays Bank PLC, as administrative agent and collateral agent for the Lenders. The Repricing Amendment 1 decreased the applicable margin for borrowings under the Company’s Term Loan Facility to 2.50% for base rate borrowings and 3.50% for LIBOR borrowings and extended the period during which a prepayment premium may be required for a “Repricing Transaction” (as defined in the Credit Agreement) until six months after the effective date of the Repricing Amendment 1. In connection with the execution of the Repricing

Amendment 1, the Company paid a prepayment premium of 1.00%, or $7,300, as well as certain fees and expenses of the administrative agent and the Lenders, in accordance with the terms of the Credit Agreement. Immediately prior to the effectiveness of the Repricing Amendment 1, the Company prepaid $50,000 of principal under the Credit Agreement. In September 2016, the Company prepaid an additional $60,000 under the Credit Agreement.

On September 30, 2016, the Company entered into an interest rate swap agreement, which has a maturity date of September 30, 2020, to fix the rate on $335,000 of the then-outstanding balance of the Credit Agreement. The rate is fixed at 1.198% per annum plus the applicable credit spread, which was 1.75% at September 30, 2018. The notional amount of this transaction was $290,000 and had a fair value of $8,539 at September 30, 2018.

On December 14, 2016, the Company entered into Amendment No. 2 (the "Repricing Amendment 2") to the Credit Agreement by and among the Company, the Lenders and Barclays Bank PLC, as administrative agent and collateral agent for the Lenders. The Repricing Amendment 2 decreased the applicable margin for the Company’s term loan under the Credit Agreement to 2.75% for LIBOR borrowings and 1.75% for base rate borrowings and reset the period during which a prepayment premium may be required for a Repricing Transaction until six months after the effective date of the Repricing Amendment 2. In November 2016, prior to the effectiveness of the Repricing Amendment 2, the Company prepaid an additional $40,000 of principal under the Credit Agreement. In March 2017, the Company prepaid an additional $50,000 of principal under the Credit Agreement.

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On July 6, 2017, the Company entered into Amendment No. 3 (the “Repricing Amendment 3”) to the Credit Agreement by and among the Company, the Lenders and Barclays Bank PLC, as administrative agent and collateral agent for the Lenders. The Repricing Amendment 3 decreased the applicable margin for the Company’s term loan under the Credit Agreement to 2.25% for LIBOR rate loans when the Total Leverage Ratio (as defined in the Credit Agreement) was at or above 1.25:1 and decreased to 2.00% when the Total Leverage Ratio was below 1.25:1, both with a LIBOR floor of 0.75%. The margin for base rate borrowings decreased to 1.25% when the Total Leverage Ratio is at or above 1.25:1 and to 1.00% when the Total Leverage Ratio is below 1.25:1. The period during which a prepayment premium may be required for a Repricing Transaction was reset to six months after the effective date of the Repricing Amendment 3.

On April 11, 2018, the Company entered into Amendment No. 4 (the “Repricing Amendment 4”) to the Credit Agreement by and among the Company, the Lenders and Barclays Bank PLC, as administrative agent and collateral agent for the Lenders. The Repricing Amendment 4 decreased the applicable margin for the Company’s LIBOR rate term loan under the Credit Agreement to 1.75%, with a LIBOR rate floor of 0.75%. The margin for base rate borrowings decreased to 0.75% with a base rate floor of 1.75%. The period during which a prepayment premium may be required for a Repricing Transaction was reset to six months after the effective date of the Repricing Amendment 4.

In July 2017, August 2017, November 2017 and March 2018, the Company voluntarily prepaid $50,000, $75,000, $50,000 and $50,000, respectively, of principal under the Credit Agreement. As of September 30, 2018, after total prepayments of $425,000 and regularly scheduled principal payments of $6,536, the total outstanding principal balance was $348,464. The interest rate as of September 30, 2018 was 3.8%.

The Company incurred $28,747 of deferred finance fees, original issue discount and repricing fees related to the term loans under the Term Loan Facility, which are included in long-term debt in the accompanying consolidated balance sheets and are being amortized to interest expense over the estimated life of the term loans using the effective interest method. A portion of these fees has been accelerated in connection with the various debt prepayments during 2016, 2017 and 2018. As of September 30, 2018, the remaining balance of the deferred finance fees, original issue discount and repricing fee related to the Term Loan Facility was $5,581.

Under the Credit Agreement, the Company is required to prepay outstanding term loans, subject to certain exceptions, with portions of its annual excess cash flow as well as with the net cash proceeds of certain asset sales, certain casualty and condemnation events and the incurrence or issuance of certain debt. The Company is also required to make scheduled quarterly payments each equal to 0.25% of the principal amount of the term loans outstanding, less the amount of certain voluntary and mandatory repayments after such date, with the balance due on the seventh anniversary of the closing date. As a result of making total prepayments of $425,000 through September 30, 2018 and based on the Company’s Total Leverage Ratio, the Company is no longer required to make any scheduled principal payments until maturity date of the loan.

All obligations under the Term Loan Facility are guaranteed by certain of the Company’s domestic subsidiaries, and are collateralized by substantially all of the Company’s assets and the assets of such subsidiaries, subject to certain exceptions and exclusions.

The Credit Agreement contains customary representations and warranties, affirmative and negative covenants and provisions relating to events of default. If an event of default occurs, the Lenders under the Term Loan Facility will be

entitled to take various actions, including the acceleration of amounts due under the Term Loan Facility and all actions generally permitted to be taken by a secured creditor. At September 30, 2018, the Company was in compliance with all covenants under the Credit Agreement.

Senior Secured Asset-Based Revolving Credit Facility

In connection with the completion of the Newport Merger, the Company also entered into an asset-based credit agreement with Deutsche Bank AG New York Branch, as administrative agent and collateral agent, the other borrowers from time to time party thereto, and the lenders and letters of credit issuers from time to time party thereto (the “ABL Facility”), that provides senior secured financing of up to $50,000, subject to a borrowing base limitation. The borrowing base for the ABL Facility at any time equals the sum of: (a) 85% of certain eligible accounts; plus (b) subject to certain notice and field examination and appraisal requirements, the lesser of (i) the lesser of (A) 65% of the lower of cost or market value of certain eligible inventory and (B) 85% of the net orderly liquidation value of certain eligible inventory and (ii) 30% of the borrowing base; minus (c) reserves established by the administrative agent; provided that until the administrative agent’s receipt of a field examination of accounts receivable the borrowing base shall be equal to 70% of the book value of certain eligible accounts. The ABL Facility includes borrowing capacity in the form of letters of credit up to $15,000. The Company has not drawn against the ABL Facility as of September 30, 2018.

Borrowings under the ABL Facility bear interest per annum at one of the following rates selected by the Company: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the “prime rate” quoted in The Wall Street Journal, and (3) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00%, plus, in each case, an initial applicable margin of 0.75%; and (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, plus an initial applicable margin of 1.75%. Commencing with the completion of the first fiscal quarter ending after the closing of the ABL Facility, the applicable margin for borrowings thereunder is subject to upward or downward adjustment each fiscal quarter, based on the average historical excess availability during the preceding quarter.

The Company incurred $1,201 of costs in connection with the ABL Facility, which were capitalized and included in other assets in the accompanying consolidated balance sheets and are being amortized to interest expense using the straight-line method over the contractual term of five years of the ABL Facility.

In addition to paying interest on outstanding principal under the ABL Facility, the Company is required to pay a commitment fee in respect of the unutilized commitments thereunder. The initial commitment fee is 0.375% per annum. The total commitment fees recognized in interest expense for the three and nine months ended September 30, 2018 were immaterial. Commencing with the completion of the first fiscal quarter ending after the closing of the ABL Facility, the commitment fee is subject to downward adjustment based on the amount of average unutilized commitments for the three month period immediately preceding such adjustment date. The Company must also pay customary letter of credit fees and agency fees.

Lines of Credit and Short-Term Borrowing Arrangements

One of the Company’s Japanese subsidiaries has lines of credit and short-term borrowing arrangements with two financial institutions, which arrangements generally expire and are renewed at three month intervals. The lines of credit provided for aggregate borrowings as of September 30, 2018 of up to an equivalent of $35,623 U.S. dollars. One of the borrowing arrangements has an interest rate based on the Tokyo Interbank Offer Rate at the time of borrowing and the other has an interest rate based on the Japanese Short-Term Prime Lending Rate. Total borrowings outstanding under these arrangements were $484 at September 30, 2018. There were no borrowings outstanding under these arrangements at December 31, 2017.

The Company assumed various revolving lines of credit and a financing facility with the completion of the Newport Merger. These revolving lines of credit and financing facility have no expiration date and provided for aggregate borrowings as of September 30, 2018 of up to an equivalent of $10,995 U.S. dollars. These lines of credit have a base interest rate of 1.25% plus a Japanese Yen overnight LIBOR rate. Total borrowings outstanding under these arrangements were $5,040 and $2,965 at September 30, 2018 and December 31, 2017.

One of the Company’s Austrian subsidiaries has various outstanding loans from the Austrian government to fund research and development. These loans are unsecured and do not require principal repayment as long as certain conditions are met. Interest on these loans is payable semi-annually. The interest rates associated with these loans

range from 0.75% to 2.00%.

| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Short-term debt: | | |
| Japanese lines of credit | $ 5,524 | $ 2,750 |
| Japanese receivables financing facility | — | 215 |
| Austrian loans due through March 2020 | 606 | — |
| Other debt | — | 7 |
| | $ 6,130 | $ 2,972 |

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| | September 30, 2018 | December 31, 2017 |
|---|---|---|
| Long-term debt: | | |
| Austrian loans due through March 2020 and other debt | $ 87 | $ 714 |
| Term Loan Facility, net[(1)] | 342,883 | 389,279 |
| | $ 342,970 | $ 389,993 |

[(1)] Net of deferred financing fees, original issuance discount and repricing fee of $5,581 and $9,185 as of September 30, 2018 and December 31, 2017, respectively.

The Company recognized interest expense of $13,071 and $23,001 for the nine months ended September 30, 2018 and 2017, respectively.

Contractual maturities of the Company's debt obligations as of September 30, 2018 are as follows:

| Year | Amount |
|---|---|
| 2018 (remaining) | $5,524 |
| 2019 | $606 |
| 2020 | $73 |
| 2021 | $14 |
| 2022 | $— |
| 2023 | $— |
| Thereafter | $348,464 |

11) Product Warranties

The Company records the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. While the Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component suppliers, the Company's warranty obligation is affected by shipment volume, product failure rates, utilization levels, material usage, and supplier warranties on parts delivered to the Company. Should actual product failure rates, utilization levels, material usage, or supplier warranties on parts differ from the Company's estimates, revisions to the estimated warranty liability would be required.

Product warranty activities were as follows:

| | Nine Months Ended September 30, | |
|---|---|---|
| | 2018 | 2017 |

| | | |
|---|---|---|
| Beginning of period | $10,104 | $8,261 |
| Provision for product warranties | 11,448 | 11,941 |
| Direct and other charges to warranty liability | | |