# UNITED STATES
# SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

# FORM 10-Q

**(Mark One)**

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

**For the Quarterly Period Ended March 30, 2019**

**or**

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

**For the transition period from to**

**Commission File Number: 001-33962**

# COHERENT, INC.

| | |
|---|---|
| **Delaware** | **94-1622541** |
| (State or other jurisdiction of incorporation or organization) | (I.R.S. Employer Identification No.) |

**5100 Patrick Henry Drive, Santa Clara, California 95054**
(Address of principal executive offices) (Zip Code)

Registrant’s telephone number, including area code: **(408) 764-4000**

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

| Title of each class | Trading Symbol(s) | Name of each exchange on which registered |
|---|---|---|
| **Common Stock, $0.01 par value** | **COHR** | **The NASDAQ Stock Market LLC 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, a smaller reporting company, or an emerging growth company. See 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 ☒

The number of shares outstanding of registrant’s common stock, par value $.01 per share, on May 6, 2019 was 24,190,771.

**COHERENT, INC.**

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## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This quarterly report contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. All statements included in or incorporated by reference in this quarterly report, other than statements of historical fact, are forward-looking statements. These statements are generally accompanied by words such as "trend," "may," "will," could," "would," "should," "expect," "plan," "anticipate," "rely," "believe," "estimate," "predict," "intend," "potential," "continue," "outlook," "forecast" or the negative of such terms, or other comparable terminology, including without limitation statements made under "Our Strategy" and in "Management's Discussion and Analysis of Financial Condition and Results of Operations." Forward-looking statements also include the assumptions underlying or relating to any of the foregoing statements. Actual results of Coherent, Inc. (referred to herein as the Company, we, our or Coherent) may differ significantly from those anticipated in these forward-looking statements as a result of various factors, including those discussed in the sections captioned "Our Strategy," "Risk Factors" and "Key Performance Indicators," as well as any other cautionary language in this quarterly report. All forward-looking statements included in the document are based on information available to us on the date hereof. We undertake no obligation to update these forward-looking statements as a result of events or circumstances or to reflect the occurrence of unanticipated events or non-occurrence of anticipated events, except to the extent required by law.

## PART I. FINANCIAL INFORMATION

## ITEM 1. FINANCIAL STATEMENTS

### COHERENT, INC. AND SUBSIDIARIES
### CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
*(Unaudited; in thousands, except per share data)*

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | March 30, 2019 | March 31, 2018 | March 30, 2019 | March 31, 2018 |
| **Net sales** | **$ 372,860** | $ 481,118 | **$ 756,006** | $ 958,683 |
| **Cost of sales** | **242,143** | 265,688 | **475,939** | 526,230 |
| **Gross profit** | **130,717** | 215,430 | **280,067** | 432,453 |
| **Operating expenses:** | | | | |
| Research and development | **30,461** | 34,783 | **59,403** | 66,175 |
| Selling, general and administrative | **69,463** | 77,146 | **134,020** | 150,583 |
| Impairment and other charges | **—** | (110) | **—** | 155 |
| Amortization of intangible assets | **1,926** | 2,950 | **4,966** | 5,556 |
| Total operating expenses | **101,850** | 114,769 | **198,389** | 222,469 |
| **Income from operations** | **28,867** | 100,661 | **81,678** | 209,984 |
| **Other income (expense):** | | | | |
| Interest income | **418** | 440 | **646** | 911 |
| Interest expense | **(4,919)** | (7,725) | **(9,820)** | (16,472) |
| Other—net | **249** | (2,225) | **(4,229)** | (2,449) |
| Total other income (expense), net | **(4,252)** | (9,510) | **(13,403)** | (18,010) |
| **Income from continuing operations before income taxes** | **24,615** | 91,151 | **68,275** | 191,974 |
| Provision for income taxes | **3,865** | 25,849 | **11,975** | 84,769 |
| **Net income from continuing operations** | **20,750** | 65,302 | **56,300** | 107,205 |
| Loss from discontinued operations, net of income taxes | **—** | — | **—** | (2) |
| **Net income** | **$ 20,750** | $ 65,302 | **$ 56,300** | $ 107,203 |
| | | | | |
| **Net income per share:** | | | | |
| Basic | **$ 0.86** | $ 2.64 | **$ 2.32** | $ 4.34 |
| Diluted | **$ 0.85** | $ 2.61 | **$ 2.31** | $ 4.29 |
| | | | | |
| **Shares used in computation:** | | | | |
| Basic | **24,232** | 24,761 | **24,250** | 24,698 |
| Diluted | **24,332** | 25,010 | **24,402** | 25,018 |

*See Accompanying Notes to Condensed Consolidated Financial Statements.*

**COHERENT, INC. AND SUBSIDIARIES**
**CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME**
*(Unaudited; in thousands)*

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | March 30, 2019 | March 31, 2018 | March 30, 2019 | March 31, 2018 |
| Net income | **$ 20,750** | $ 65,302 | **$ 56,300** | $ 107,203 |
| Other comprehensive income (loss): (1) | | | | |
| Translation adjustment, net of taxes (2) | **(7,578)** | 21,344 | **(13,268)** | 21,436 |
| Changes in unrealized losses on available-for-sale securities, net of taxes (3) | **—** | (1) | **—** | (8) |
| Defined benefit pension plans, net of taxes (4) | **(756)** | (344) | **(748)** | (197) |
| Other comprehensive income (loss), net of tax | **(8,334)** | 20,999 | **(14,016)** | 21,231 |
| Comprehensive income | **$ 12,416** | $ 86,301 | **$ 42,284** | $ 128,434 |

(1) Reclassification adjustments were not significant during the three and six months ended March 30, 2019 and March 31, 2018.

(2) Tax benefits of $691 and $3,446 were provided on translation adjustments during the three and six months ended March 30, 2019, respectively. Tax expenses (benefits) were not provided on translation adjustments during the three and six months ended March 31, 2018.

(3) Tax expenses (benefits) were not provided on changes in unrealized losses on available-for-sale securities for the three and six months ended March 30, 2019, respectively. Tax expenses (benefits) of $1 and $(3) were provided on changes in unrealized losses on available-for-sale securities for the three and six months ended March 31, 2018, respectively.

(4) Tax benefits of $277 and $283 were provided on changes in defined benefit pension plans for the three and six months ended March 30, 2019, respectively. Tax benefits of $9 and $55 were provided on changes in defined benefit pension plans for the three and six months ended March 31, 2018, respectively.

*See Accompanying Notes to Condensed Consolidated Financial Statements.*

**COHERENT, INC. AND SUBSIDIARIES**
**CONDENSED CONSOLIDATED BALANCE SHEETS**
*(Unaudited; in thousands, except par value)*

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| **ASSETS** | | |
| Current assets: | | |
| Cash and cash equivalents | **$ 337,321** | $ 310,495 |
| Restricted cash | **814** | 858 |
| Short-term investments | **11,480** | 120 |
| Accounts receivable—net of allowances of $5,817 and $4,568, respectively | **313,351** | 355,208 |
| Inventories | **483,741** | 486,741 |
| Prepaid expenses and other assets | **79,465** | 85,080 |
| Total current assets | **1,226,172** | 1,238,502 |
| Property and equipment, net | **318,989** | 311,793 |
| Goodwill | **435,997** | 442,940 |
| Intangible assets, net | **119,258** | 142,293 |
| Non-current restricted cash | **12,338** | 12,692 |
| Other assets | **109,514** | 111,749 |
| Total assets | **$ 2,222,268** | $ 2,259,969 |
| **LIABILITIES AND STOCKHOLDERS' EQUITY** | | |
| Current liabilities: | | |
| Short-term borrowings and current-portion of long-term obligations | **$ 46,979** | $ 5,072 |
| Accounts payable | **68,155** | 70,292 |
| Income taxes payable | **85,811** | 114,145 |
| Other current liabilities | **163,953** | 183,329 |
| Total current liabilities | **364,898** | 372,838 |
| Long-term obligations | **405,837** | 420,711 |
| Other long-term liabilities | **138,751** | 151,956 |
| Commitments and contingencies (Note 12) | | |
| Stockholders' equity: | | |
| Common stock, Authorized—500,000 shares, par value $.01 per share: | | |
| Outstanding—24,137 shares and 24,299 shares, respectively | **240** | 242 |
| Additional paid-in capital | **34,736** | 78,700 |
| Accumulated other comprehensive income (loss) | **(11,183)** | 2,833 |
| Retained earnings | **1,288,989** | 1,232,689 |
| Total stockholders' equity | **1,312,782** | 1,314,464 |
| Total liabilities and stockholders' equity | **$ 2,222,268** | $ 2,259,969 |

*See Accompanying Notes to Condensed Consolidated Financial Statements.*

**COHERENT, INC. AND SUBSIDIARIES**
**CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY**
*(Unaudited; in thousands)*

| | Common Stock Shares | Common Stock Par Value | Add. Paid-in Capital | Accum. Other Comp. Income (Loss) | Retained Earnings | Total |
|---|---|---|---|---|---|---|
| **Balances, September 30, 2017** | **24,631** | **$ 245** | **$ 171,403** | **$ 19,906** | **$ 971,710** | **$ 1,163,264** |
| Common stock issued under stock plans, net of shares withheld for employee taxes | 191 | 2 | (30,749) | — | — | (30,747) |
| Cumulative effect of change in accounting principle | — | — | — | — | 13,621 | 13,621 |
| Stock-based compensation | — | — | 7,110 | — | — | 7,110 |
| Net income | — | — | — | — | 41,901 | 41,901 |
| Other comprehensive income, net of tax | — | — | — | 232 | — | 232 |
| **Balances, December 30, 2017** | **24,822** | **247** | **147,764** | **20,138** | **1,027,232** | **1,195,381** |
| Common stock issued under stock plans, net of shares withheld for employee taxes | 12 | — | (604) | — | — | (604) |
| Stock-based compensation | — | — | 8,603 | — | — | 8,603 |
| Net income | — | — | — | — | 65,302 | 65,302 |
| Other comprehensive income, net of tax | — | — | — | 20,999 | — | 20,999 |
| **Balances, March 31, 2018** | **24,834** | **$ 247** | **$ 155,763** | **$ 41,137** | **$ 1,092,534** | **$ 1,289,681** |

| | Common Stock Shares | Common Stock Par Value | Add. Paid-in Capital | Accum. Other Comp. Income (Loss) | Retained Earnings | Total |
|---|---|---|---|---|---|---|
| **Balances, September 29, 2018** | **24,299** | **$ 242** | **$ 78,700** | **$ 2,833** | **$ 1,232,689** | **$ 1,314,464** |
| Common stock issued under stock plans, net of shares withheld for employee taxes | 223 | 2 | (9,141) | — | — | (9,139) |
| Repurchase of common stock | (195) | (2) | (25,499) | — | — | (25,501) |
| Stock-based compensation | — | — | 7,791 | — | — | 7,791 |
| Net income | — | — | — | — | 35,550 | 35,550 |
| Other comprehensive loss, net of tax | — | — | — | (5,682) | — | (5,682) |
| **Balances, December 29, 2018** | **24,327** | **242** | **51,851** | **(2,849)** | **1,268,239** | **1,317,483** |
| Common stock issued under stock plans, net of shares withheld for employee taxes | 10 | — | (298) | — | — | (298) |
| Repurchase of common stock | (200) | (2) | (25,903) | — | — | (25,905) |
| Stock-based compensation | — | — | 9,086 | — | — | 9,086 |
| Net income | — | — | — | — | 20,750 | 20,750 |
| Other comprehensive loss, net of tax | — | — | — | (8,334) | — | (8,334) |
| **Balances, March 30, 2019** | **24,137** | **$ 240** | **$ 34,736** | **$ (11,183)** | **$ 1,288,989** | **$ 1,312,782** |

*See Accompanying Notes to Condensed Consolidated Financial Statements.*

**COHERENT, INC. AND SUBSIDIARIES**
**CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS**
*(Unaudited; in thousands)*

| | Six Months Ended | |
|---|---|---|
| | March 30, 2019 | March 31, 2018 |
| **Cash flows from operating activities:** | | |
| Net income | **$ 56,300** | $ 107,203 |
| Adjustments to reconcile net income to net cash provided by operating activities: | | |
| Depreciation and amortization | **27,690** | 25,399 |
| Amortization of intangible assets | **29,099** | 30,429 |
| Deferred income taxes | **(4,453)** | 14,079 |
| Amortization of debt issuance cost | **2,562** | 7,221 |
| Stock-based compensation | **16,880** | 15,486 |
| Non-cash restructuring charges | **323** | 439 |
| Other non-cash expense (income) | **(1,224)** | 92 |
| Changes in assets and liabilities, net of effect of acquisitions: | | |
| Accounts receivable | **40,560** | 5,785 |
| Inventories | **(2,649)** | (59,678) |
| Prepaid expenses and other assets | **9,992** | (5,193) |
| Other long-term assets | **2,300** | (3,753) |
| Accounts payable | **(802)** | 13,587 |
| Income taxes payable/receivable | **(29,192)** | 20,815 |
| Other current liabilities | **(20,671)** | (41,575) |
| Other long-term liabilities | **(392)** | 2,463 |
| Net cash provided by operating activities | **126,323** | 132,799 |
| **Cash flows from investing activities:** | | |
| Purchases of property and equipment | **(41,525)** | (44,951) |
| Proceeds from dispositions of property and equipment | **4,331** | 90 |
| Purchases of available-for-sale securities | **(11,433)** | (32,838) |
| Proceeds from sales and maturities of available-for-sale securities | **93** | 28,197 |
| Acquisition of businesses, net of cash acquired | **(18,881)** | (45,448) |
| Investment at cost | **(3,423)** | — |
| Proceeds from sale of discontinued operation | **—** | 25,000 |
| Other | **—** | 470 |
| Net cash used in investing activities | **(70,838)** | (69,480) |
| **Cash flows from financing activities:** | | |
| Short-term borrowings | **88,424** | 36,672 |
| Repayments of short-term borrowings | **(48,235)** | (36,955) |
| Repayments of long-term borrowings | **(3,802)** | (166,913) |
| Issuance of common stock under employee stock option and purchase plans | **5,704** | 4,899 |
| Net settlement of restricted common stock | **(15,141)** | (36,250) |
| Repurchase of common stock | **(51,406)** | — |
| Net cash used in financing activities | **(24,456)** | (198,547) |
| **Effect of exchange rate changes on cash, cash equivalents and restricted cash** | **(4,601)** | 1,704 |
| **Net increase (decrease) in cash, cash equivalents and restricted cash** | **26,428** | (133,524) |
| **Cash, cash equivalents and restricted cash, beginning of period** | **324,045** | 457,087 |
| **Cash, cash equivalents and restricted cash, end of period** | **$ 350,473** | $ 323,563 |
| **Non-cash investing and financing activities:** | | |
| Unpaid property and equipment purchases | **$ 5,351** | $ 3,362 |

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets that sum to the total of the same amounts shown in the condensed consolidated statements of cash flows.

| | March 30, 2019 | March 31, 2018 |
|---|---|---|
| Cash and cash equivalents | **$ 337,321** | $ 308,987 |
| Restricted cash, current | **814** | 1,144 |
| Restricted cash, non-current | **12,338** | 13,432 |
| Total cash, cash equivalents, and restricted cash shown in the condensed consolidated statement of cash flows | **$ 350,473** | $ 323,563 |

*See Accompanying Notes to Condensed Consolidated Financial Statements.*

**COHERENT, INC. AND SUBSIDIARIES**
**NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS**
*(Unaudited)*

## 1. BASIS OF PRESENTATION

The accompanying unaudited condensed consolidated financial statements have been prepared pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP") have been condensed or omitted pursuant to such rules and regulations. These interim condensed consolidated financial statements and notes thereto should be read in conjunction with the consolidated financial statements and notes thereto filed by Coherent, Inc. on Form 10-K for the fiscal year ended September 29, 2018. In the opinion of management, all adjustments necessary for a fair presentation of financial condition and results of operation as of and for the periods presented have been made and include only normal recurring adjustments. Interim results of operations are not necessarily indicative of results to be expected for the year or any other interim periods. Our fiscal year ends on the Saturday closest to September 30 and our second fiscal quarters include 13 weeks of operations in each fiscal year presented. Fiscal year 2019 and 2018 both include 52 weeks.

The consolidated financial statements include the accounts of Coherent, Inc. and its direct and indirect subsidiaries (collectively, the "Company", "we", "our", "us" or "Coherent"). Intercompany balances and transactions have been eliminated.

On October 5, 2018, we acquired privately held Ondax, Inc. ("Ondax"). On March 8, 2018, we acquired privately held O.R. Lasertechnologie GmbH and certain assets of its U.S.-based affiliate (collectively "OR Laser"). The significant accounting policies of Ondax and OR Laser have been aligned to conform to those of Coherent, and the consolidated financial statements include the results of Ondax and OR Laser as of their acquisition dates.

The preparation of consolidated financial statements in conformity with Generally Accepted Accounting Principles ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

### Change in Significant Accounting Policies - Revenue Recognition

Except for the adoption of Accounting Standard Update ("ASU") 2014-09, Revenue from Contracts with Customers ("ASC 606") on September 30, 2018, there have been no significant changes to our significant accounting policies as of and for the six months ended March 30, 2019, as compared to the significant accounting policies described in our Annual Report on Form 10-K for the year ended September 29, 2018.

Effective September 30, 2018, we adopted ASC 606, using the modified retrospective transition method applied to contracts that were not completed as of September 30, 2018. Revenue for the reporting periods after September 30, 2018 are presented under ASC 606, while prior period amounts are reported in accordance with our historical accounting under ASC 605. There was no impact on the opening accumulated retained earnings, revenues, costs, deferred income, customer deposits or other balances as of September 30, 2018 or the three and six months ended March 30, 2019 due to the adoption of ASC 606.

Under ASC 606, we determine revenue recognition by applying the following five-step approach:

Step 1 Identification of the contract, or contracts, with a customer;
Step 2 Identification of the performance obligations in the contract;
Step 3 Determination of the transaction price;
Step 4 Allocation of the transaction price to the performance obligations in the contract; and
Step 5 Recognition of revenue when, or as, we satisfy each performance obligation.

Contracts and customer purchase orders, which in some cases are governed by master sales agreements, are generally used to determine the existence of an arrangement. In addition, shipping documents and customer acceptance, if applicable, are used to verify delivery and transfer of control. Performance obligations are identified based on the products or services that will be transferred to the customer that are considered distinct. Being distinct is defined as products or services that the customer can benefit from either on its own or together with other resources that are readily available from third parties or from us, and by the product or service being separately identifiable from other promises in the contract. We assess our ability to collect from our customers based primarily on the creditworthiness and past payment history of each customer. Revenue from all sales are recognized at the transaction price. The transaction price is determined based on the consideration to which we will be entitled in exchange for transferring goods or services to the customer adjusted for estimated variable consideration, if any. The consideration associated with customer contracts is generally fixed. Variable consideration includes discounts, rebates, credits and incentives, or other similar items. The amount of consideration that can vary is not a substantial portion of the total consideration. Variable consideration estimates are re-assessed at each reporting period until a final outcome is determined. Changes to the original transaction price due to a change in estimated variable consideration are calculated on a retrospective basis, with the adjustment recorded in the period in which the change occurs.

Sales to customers are generally not subject to any price protection or return rights. Accordingly, upon application of steps one through five above, product revenue is recognized upon shipment and transfer of control. The majority of products and services offered by us have readily observable selling prices. As a part of our stand-alone selling price policy, we review product pricing on a periodic basis to identify any significant changes and revise our expected selling price assumptions as appropriate.

We record taxes collected on revenue-producing activities on a net basis.

*Revenue recognition at a point in time*

Revenues recognized at a point in time consist primarily of product, installation and training. The majority of our sales are made to original equipment manufacturers ("OEMs"), distributors, representatives and end-users. Sales made to customers generally do not require installation of the products by us and are not subject to other post-delivery obligations. Sales to end-users in the scientific market typically require installation by us and, thus, involve post-delivery obligations; however, our post-delivery installation obligations are not essential to the functionality of our products and represent a separate performance obligation. We recognize revenue for these sales following the transfer of control of such products to the customer, which typically occurs upon shipment or delivery depending on the terms of the underlying contracts. In those instances that we have agreed to perform installation or provide training, we defer revenue related to installation or training until these services have been rendered.

Our sales to distributors, representatives and end-user customers typically do not have customer acceptance provisions and only certain of our sales to OEM customers and integrators have customer acceptance provisions. Customer acceptance is generally limited to performance under our published product specifications. For the few product sales that have customer acceptance provisions because of more advanced performance than our published specifications, the revenue is recognized when the control transfers or the revenue is deferred until customer acceptance occurs.

*Revenue recognition over time*

We periodically enter into contracts in which a customer may purchase a combination of goods and/or services, such as products with maintenance contracts or extended warranty. These contracts are evaluated to determine if the multiple promises are separate performance obligations. Once we determine the performance obligations, we then determine the transaction price, which includes estimating the amount of variable consideration, if any. We then allocate the transaction price to each performance obligation in the contract based on a relative stand-alone selling price charged separately to customers. Extended warranties are sold separately from products and represent a distinct performance obligation. Revenue related to the performance obligation for extended warranties is recognized over time as the customer simultaneously receives and consumes the benefits provided by us.

Customized products, for which we have an enforceable right to payment for performance completed to date, are recorded over time. We use the output method to recognize revenue over time for such contracts as it best depicts the satisfaction of our performance obligations.

*Shipping and handling costs*

We record costs related to shipping and handling of net sales in cost of sales for all periods presented. Shipping and handling fees billed to customers are included in net sales. Customs duties billed to customers are recorded in cost of sales.

*Warranty*

We provide warranties on the majority of our product sales and reserves for estimated warranty costs are recorded during the period of sale. These standard warranties are assurance type warranties and do not offer any services beyond the assurance that the product will continue working as specified. Therefore, these warranties are not considered separate performance obligations in the arrangement. Instead, the expected cost of the warranty is accrued as an expense. The determination of such reserves requires us to make estimates of product return rates and expected costs to repair or replace the products under warranty. We currently establish warranty reserves based on historical warranty costs for each product line. The weighted average warranty period covered is approximately 15 months. If actual return rates and/or repair and replacement costs differ significantly from our estimates, adjustments to cost of sales may be required in future periods.

*Costs of obtaining a contract*

We recognize the incremental direct costs of obtaining a contract from a customer as an expense, which primarily includes sales commissions. Sales commissions are recorded at a point of time when control of the product transfers or over a period of time when sales commission provided is expected to be recovered through future services. The costs are recorded within selling, general and administrative expense. Costs incurred prior to the transfer of control of the product to the customer and costs to be amortized over a future period are classified as a prepaid asset and are included in prepaid expenses and other assets. Upon adoption of ASC 606, we determined there was an immaterial impact on sales commissions, therefore, we did not record a transition adjustment on adoption.

*Payment terms*

Our standard payment terms are 30 days but vary by the industry and location of the customer and the products or services offered. The time between invoicing and when payment is due is not significant. As our standard payment terms are less than one year, we have elected the practical expedient under ASC 606-10-32-18 and therefore are not required to assess whether each contract has a significant financing component.

*Customer deposits and deferred revenue*

When we receive consideration from a customer prior to transferring goods or services under the terms of a sales contract, we record customer deposits or deferred revenue, depending on whether or not the product has shipped to the customer, which are included in other current liabilities or other long-term liabilities when the payment is made or due, whichever is earlier. We recognize deferred revenue as net sales after control of the goods or services has been transferred to the customer and all revenue recognition criteria are met.

## 2. RECENT ACCOUNTING STANDARDS

**Adoption of New Accounting Pronouncement**

We adopted ASC 606 and all related amendments as of September 30, 2018 using the modified retrospective transition method applied to contracts that were not completed as of September 29, 2018 and all new contracts entered into by us subsequent to September 29, 2018. All prior period financial statements and disclosures are presented in accordance with ASC 605. We concluded that the adoption of the new standard did not have a material impact on the timing or amount of revenue recognized as the majority of our sales are not bundled. Therefore, revenue will be recorded at the point-in-time when control transfers, which is consistent with the timing of revenue recognition under ASC 605. See Note 1, "Basis of Presentation" and Note 3, "Revenue Recognition" to the Notes to Condensed Consolidated Financial Statements for more information.

In August 2018, the Securities and Exchange Commission ("SEC") adopted amendments to certain disclosure requirements in Securities Act Release No. 33-10532, Disclosure Update and Simplification. The amendments became effective on November 5, 2018. The SEC staff subsequently indicated that it would not object if a filer’s first presentation of changes in shareholders’ equity is included in its Form 10-Q for the quarter that begins after the final rule’s effective date. Among the amendments is the requirement to present the changes in shareholders’ equity in the interim financial statements (either in a separate statement or footnote) in quarterly reports on Form 10-Q. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a consolidated statement of operations is required to be filed. We adopted this amendment and included the first presentation of changes in stockholders’ equity in our quarterly report on Form 10-Q for our first quarter of fiscal 2019.

**Recently Issued Accounting Pronouncements**

In February 2016, the FASB issued accounting guidance (ASC 842) that modifies lease accounting for lessees to increase transparency and comparability by recording lease assets and liabilities for operating leases and disclosing key information about leasing arrangements. The new standard will become effective for our fiscal year 2020, which begins on September 29, 2019. We will adopt the new guidance utilizing the modified retrospective transition method. We have reviewed the requirements of this standard and have formulated a plan for implementation. We continue to implement internal controls and key system functionality to enable the preparation of financial information. We expect the standard will have a material impact on our consolidated balance sheets, but will not have a material impact on our consolidated income statements. The most significant impact will be the recognition of Right-Of-Use assets and lease liabilities for operating leases, while our accounting for capital leases will remain substantially unchanged. We will continue to assess and disclose the impact that this new guidance will have on our consolidated financial statements, disclosures and related controls, when known.

## 3. REVENUE RECOGNITION

***Disaggregation of Revenue***

Based on the information that our chief operating decision maker ("CODM") uses to manage the business, we disaggregate revenue by type and market application within each segment. No other level of disaggregation is required considering the type of products, customers, markets, contracts, duration of contracts, timing of transfer of control and sales channels.

The following tables summarize revenue from contracts with customers (in thousands):

*Sales by revenue type and segment*

| | Three months ended | | | |
|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | |
| | OEM Laser Sources | Industrial Lasers & Systems | OEM Laser Sources | Industrial Lasers & Systems |
| Net sales: | | | | |
| Products[1] | $ 143,895 | $ 112,779 | $ 220,624 | $ 128,665 |
| Other product and service revenues[2] | 87,702 | 28,484 | 96,514 | 35,315 |
| Total net sales | $ 231,597 | $ 141,263 | $ 317,138 | $ 163,980 |

(1) Net sales primarily recognized at a point in time.
(2) Includes sales of spare parts, related accessories and other consumable parts as well as revenues from service agreements, of which $13.4 million for the three months ended March 30, 2019 was recognized over time.

| | Six months ended | | | |
|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | |
| | OEM Laser Sources | Industrial Lasers & Systems | OEM Laser Sources | Industrial Lasers & Systems |
| Net sales: | | | | |
| Products[1] | $ 296,637 | $ 224,753 | $ 451,392 | $ 246,926 |
| Other product and service revenues[2] | 177,308 | 57,308 | 191,403 | 68,962 |
| Total net sales | $ 473,945 | $ 282,061 | $ 642,795 | $ 315,888 |

(1) Net sales primarily recognized at a point in time.
(2) Includes sales of spare parts, related accessories and other consumable parts as well as revenues from service agreements, of which $26.0 million for the six months ended March 30, 2019 was recognized over time.

*Sales by market application and segment*

| | Three months ended | | | |
|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | |
| | OEM Laser Sources | Industrial Lasers & Systems | OEM Laser Sources | Industrial Lasers & Systems |
| Net sales: | | | | |
| Microelectronics | $ 152,640 | $ 16,625 | $ 237,699 | $ 23,609 |
| Materials processing | 9,484 | 95,438 | 13,622 | 122,200 |
| OEM components and instrumentation | 39,811 | 27,391 | 35,625 | 17,698 |
| Scientific and government programs | 29,662 | 1,809 | 30,192 | 473 |
| Total net sales | $ 231,597 | $ 141,263 | $ 317,138 | $ 163,980 |

| | Six months ended | | | |
|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | |
| | OEM Laser Sources | Industrial Lasers & Systems | OEM Laser Sources | Industrial Lasers & Systems |
| Net sales: | | | | |
| Microelectronics | $ 314,843 | $ 32,831 | $ 487,936 | $ 41,548 |
| Materials processing | 18,286 | 191,279 | 24,075 | 239,208 |
| OEM components and instrumentation | 79,030 | 54,525 | 68,622 | 33,557 |
| Scientific and government programs | 61,786 | 3,426 | 62,162 | 1,575 |
| Total net sales | $ 473,945 | $ 282,061 | $ 642,795 | $ 315,888 |

See Note 18, "Segment and Geographic Information" for revenue disaggregation by reportable segment and geographic region.

***Contract Balances***

We record accounts receivable when we have an unconditional right to the consideration. Contract liabilities are recorded when cash payments are received or due in advance of performance. Contract liabilities consist of customer deposits and deferred revenue, where we have unsatisfied or partly satisfied performance obligations. Contract liabilities classified as customer deposits are included in other current liabilities and contract liabilities classified as deferred revenue are included in other current liabilities or other long-term liabilities on our condensed consolidated balance sheets. Payment terms vary by customer.

A rollforward of our customer deposits and deferred revenue is as follows (in thousands):

| | |
|---|---|
| Beginning balance, September 30, 2018 (1) | $ 55,637 |
| Amount of customer deposits and deferred revenue recognized in income (2) | (96,345) |
| Additions to customer deposits and deferred revenue | 84,113 |
| Translation adjustments | (616) |
| Ending balance, March 30, 2019 (3) | $ 42,789 |

(1) Beginning customer deposits and deferred revenue as of September 30, 2018 includes $50,546 of current portion and $5,091 of long-term portion.

(2) Amount of customer deposits and deferred revenue recognized in the three and six months ended March 30, 2019 was $45,429 and $96,345, respectively.

(3) Ending customer deposits and deferred revenue as of March 30, 2019 includes $37,275 of current portion and $5,514 of long-term portion.

Remaining performance obligations represent the transaction price allocated to performance obligations that are unsatisfied or partially unsatisfied as of the end of the reporting period. The following table includes estimated revenue expected to be recognized in the future related to performance obligations for sales of maintenance agreements, extended warranties, installation, and contracts with customer acceptance provisions included in customer deposits and deferred revenue as of March 30, 2019 (in thousands):

| | Remainder of fiscal 2019 | Fiscal 2020 | Fiscal 2021 and after | Total |
|---|---|---|---|---|
| Performance Obligations | $ 29,942 | $ 9,211 | $ 3,636 | $ 42,789 |

## 4. BUSINESS COMBINATIONS

**Fiscal 2019 Acquisitions**

**Ondax**

On October 5, 2018, we acquired privately held Ondax, Inc. ("Ondax") for approximately $12.0 million, excluding transaction costs. Ondax develops and produces photonic components which are used on an OEM basis by the laser industry as well as incorporated into its own stabilized lasers and Raman Spectroscopy systems. Ondax's operating results have been included in our Industrial Lasers & Systems segment. See Note 18, "Segment and Geographic Information."

Our preliminary allocation of the purchase price is as follows (in thousands):

| | |
|---|---|
| Tangible assets: | |
| Cash | $ 103 |
| Accounts receivable | 534 |
| Inventories | 1,793 |
| Prepaid expenses and other assets | 17 |
| Deferred tax assets | 458 |
| Property and equipment | 122 |
| Liabilities assumed | (499) |
| Intangible assets: | |
| Existing technology | 5,600 |
| Customer relationships | 300 |
| Goodwill | 3,556 |
| Total | $ 11,984 |

Results of operations for the business have been included in our condensed consolidated financial statements subsequent to the date of acquisition and pro forma results of operations in accordance with authoritative guidance for prior periods have not been presented because the effect of the acquisition was not material to our prior period consolidated financial results.

The identifiable intangible assets are being amortized over their respective useful lives of 1 to 8 years. The fair values of the acquired intangibles were determined using the income approach. In performing these valuations, the key underlying probability-adjusted assumptions of the discounted cash flows were projected revenues, gross margin expectations and operating cost estimates. The valuations were based on the information that was available as of the acquisition date and the expectations and assumptions that have been deemed reasonable by our management. There are inherent uncertainties and management judgment required in these determinations. This acquisition resulted in a purchase price that exceeded the estimated fair value of tangible and intangible assets, which was allocated to goodwill.

We believe the amount of goodwill relative to identifiable intangible assets relates to several factors including: (1) potential buyer-specific synergies related to the development of new technologies; and (2) the potential to leverage our sales force to attract new customers.

None of the goodwill from this purchase is deductible for tax purposes.

**Quantum**

On October 5, 2018, we acquired certain assets of Quantum Coating, Inc. ("Quantum") for approximately $7.0 million, excluding transaction costs, and will account for the transaction as an asset purchase.

Our allocation of the purchase price is as follows (in thousands):

| | | |
|---|---|---|
| Tangible assets: | | |
| Property and equipment | $ | 2,770 |
| Intangible assets: | | |
| Existing technology | | 1,600 |
| Customer relationships | | 230 |
| Production know-how | | 2,300 |
| Backlog | | 100 |
| Total | $ | 7,000 |

The identifiable intangible assets are being amortized over their respective useful lives of 1 to 5 years. The fair values of the acquired intangibles were determined using the income approach. In performing these valuations, the key underlying probability-adjusted assumptions of the discounted cash flows were projected revenues, gross margin expectations and operating cost estimates. The valuations were based on the information that was available as of the acquisition date and the expectations and assumptions that have been deemed reasonable by our management. There are inherent uncertainties and management judgment required in these determinations.

**Fiscal 2018 Acquisitions**

**OR Laser**

On March 8, 2018, we acquired OR Laser for approximately $47.4 million, excluding transaction costs. OR Laser produced laser-based material processing equipment for a variety of uses, including additive manufacturing, welding, cladding, marking, engraving and drilling. OR Laser’s operating results have been included in our Industrial Lasers & Systems segment. See Note 18, "Segment and Geographic Information."

Our allocation of the purchase price is as follows (in thousands):

| | | |
|---|---|---|
| Tangible assets: | | |
| Cash | $ | 1,936 |
| Accounts receivable | | 3,973 |
| Inventories | | 2,360 |
| Prepaid expenses and other assets | | 630 |
| Property and equipment | | 1,515 |
| Liabilities assumed | | (5,119) |
| Deferred tax liabilities | | (4,517) |
| Intangible assets: | | |
| Existing technology | | 14,100 |
| Non-competition | | 200 |
| Backlog | | 100 |
| Customer relationships | | 700 |
| Trademarks | | 50 |
| Goodwill | | 31,456 |
| Total | $ | 47,384 |

Results of operations for the business have been included in our condensed consolidated financial statements subsequent to the date of acquisition and pro forma results of operations in accordance with authoritative guidance for prior periods have not been presented because the effect of the acquisition was not material to our prior period consolidated financial results.

The identifiable intangible assets are being amortized over their respective preliminary useful lives of 1 to 8 years. The fair values of the acquired intangibles were determined using the income approach. In performing these valuations, the key underlying probability-adjusted assumptions of the discounted cash flows were projected revenues, gross margin expectations and operating cost estimates. The valuations were based on the information that was available as of the acquisition date and the expectations and assumptions that have been deemed reasonable by our management. There are inherent uncertainties and management judgment required in these determinations. This acquisition resulted in a purchase price that exceeded the estimated fair value of tangible and intangible assets, which was allocated to goodwill.

We believe the amount of goodwill relative to identifiable intangible assets relates to several factors including: (1) potential buyer-specific synergies related to the development of new technologies related primarily to the additive manufacturing business; and (2) the potential to leverage our sales force to attract new customers and revenue and cross-sell to existing customers.

None of the goodwill from this purchase is deductible for tax purposes.

## 5. FAIR VALUES

We have not changed our valuation techniques in measuring the fair value of any financial assets and liabilities during the period. We recognize transfers between levels within the fair value hierarchy, if any, at the end of each quarter. There were no transfers between levels during the periods presented. As of March 30, 2019, we had one investment carried on a cost basis. See Note 9, "Balance Sheet Details". If we were to fair value this investment, it would be based upon Level 3 inputs; this investment is not considered material to our condensed consolidated financial statements. As of September 29, 2018, we did not have any assets or liabilities valued based upon Level 3 inputs.

We measure the fair value of outstanding debt obligations for disclosure purposes on a recurring basis. As of March 30, 2019, the current and long-term portion of long-term obligations of $5.7 million and $405.8 million, respectively, are reported at amortized cost. As of September 29, 2018, the current and long-term portion of long-term obligations of $5.1 million and $420.7 million, respectively, are reported at amortized cost. These outstanding obligations are classified as Level 2 as they are not actively traded and are valued using a discounted cash flow model that uses observable market inputs. Based on the discounted cash flow model, the fair value of the outstanding debt approximates amortized cost.

Financial assets and liabilities measured at fair value as of March 30, 2019 and September 29, 2018 are summarized below (in thousands):

| | Aggregate Fair Value | Quoted Prices in Active Markets for Identical Assets | Significant Other Observable Inputs | Aggregate Fair Value | Quoted Prices in Active Markets for Identical Assets | Significant Other Observable Inputs |
|---|---|---|---|---|---|---|
| | March 30, 2019 | | | September 29, 2018 | | |
| | | (Level 1) | (Level 2) | | (Level 1) | (Level 2) |
| Assets: | | | | | | |
| Cash equivalents: | | | | | | |
| Money market fund deposits | $ 18,740 | $ 18,740 | $ — | $ 56,285 | $ 56,285 | $ — |
| U.S. Treasury and agency obligations (1) | 120 | — | 120 | — | — | — |
| Commercial paper (1) | 3,993 | — | 3,993 | — | — | — |
| Short-term investments: | | | | | | |
| U.S. Treasury and agency obligations (1) | 5,020 | — | 5,020 | 120 | — | 120 |
| Commercial paper (1) | 6,460 | — | 6,460 | — | — | — |
| Prepaid and other assets: | | | | | | |
| Foreign currency contracts (2) | 709 | — | 709 | 1,007 | — | 1,007 |
| Money market fund deposits — Deferred comp and supplemental plan (3) | 789 | 789 | — | 522 | 522 | — |
| Mutual funds — Deferred comp and supplemental plan (3) | 20,578 | 20,578 | — | 21,862 | 21,862 | — |
| Total | $ 56,409 | $ 40,107 | $ 16,302 | $ 79,796 | $ 78,669 | $ 1,127 |
| | | | | | | |
| Liabilities: | | | | | | |
| Other current liabilities: | | | | | | |
| Foreign currency contracts (2) | (720) | — | (720) | (1,879) | — | (1,879) |
| Total | $ 55,689 | $ 40,107 | $ 15,582 | $ 77,917 | $ 78,669 | $ (752) |

(1) Valuations are based upon quoted market prices in active markets involving similar assets. The market inputs used to value these instruments generally consist of market yields, reported trades, broker/dealer quotes or alternative pricing sources with reasonable levels of price transparency. Pricing sources include industry standard data providers, security master files from large financial institutions, and other third party sources which are input into a distribution-curve-based algorithm to determine a daily market value. This creates a "consensus price" or a weighted average price for each security.

(2) The principal market in which we execute our foreign currency contracts 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. Our foreign currency contracts' valuation inputs are based on quoted prices and quoted pricing intervals from public data sources and do not involve management judgment. See Note 7, "Derivative Instruments and Hedging Activities."

(3) The fair value of mutual funds is determined based on quoted market prices. Securities traded on a national exchange are stated at the last reported sales price on the day of valuation; other securities traded in over-the-counter markets and listed securities for which no sale was reported on that date are stated as the last quoted bid price.

## 6. SHORT-TERM INVESTMENTS

We consider all highly liquid investments with maturities of three months or less at the time of purchase to be cash equivalents. Investments classified as available-for-sale are reported at fair value with unrealized gains and losses, net of related income taxes, recorded as a separate component of other comprehensive income ("OCI") in stockholders' equity until realized. Interest and amortization of premiums and discounts for debt securities are included in interest income. Gains and losses on securities sold are determined based on the specific identification method and are included in other income (expense).

Cash, cash equivalents and short-term investments consist of the following (in thousands):

| | March 30, 2019 | | | |
|---|---|---|---|---|
| | Cost Basis | Unrealized Gains | Unrealized Losses | Fair Value |
| Cash and cash equivalents | $ 337,321 | $ — | $ — | $ 337,321 |
| Short-term investments: | | | | |
| Available-for-sale securities: | | | | |
| Commercial paper | $ 6,460 | $ — | $ — | $ 6,460 |
| U.S. Treasury and agency obligations | 5,000 | 20 | — | 5,020 |
| Total short-term investments | $ 11,460 | $ 20 | $ — | $ 11,480 |

| | September 29, 2018 | | | |
|---|---|---|---|---|
| | Cost Basis | Unrealized Gains | Unrealized Losses | Fair Value |
| Cash and cash equivalents | $ 310,495 | $ — | $ — | $ 310,495 |
| Short-term investments: | | | | |
| Available-for-sale securities: | | | | |
| U.S. Treasury and agency obligations | $ 120 | $ — | $ — | $ 120 |
| Total short-term investments | $ 120 | $ — | $ — | $ 120 |

There were no unrealized losses at March 30, 2019. There were no unrealized gains or losses at September 29, 2018.

The amortized cost and estimated fair value of available-for-sale investments in debt securities as of March 30, 2019 and September 29, 2018 classified as short-term investments on our condensed consolidated balance sheet were as follows (in thousands):

| | March 30, 2019 | | September 29, 2018 | |
|---|---|---|---|---|
| | Amortized Cost | Estimated Fair Value | Amortized Cost | Estimated Fair Value |
| Investments in available-for-sale debt securities due in less than one year | $ 11,460 | $ 11,480 | $ 120 | $ 120 |

During the three and six months ended March 30, 2019, we received no proceeds from the sale of available-for-sale securities and realized no gross gains or losses. During the three months ended March 31, 2018, we received no proceeds from the sale of available-for-sale securities and realized no gross gains or losses. During the six months ended March 31, 2018, we received proceeds totaling $2.4 million from the sale of available-for-sale securities and realized no gross gains or losses.

## 7. DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES

We maintain operations in various countries outside of the United States and have foreign subsidiaries that manufacture and sell our products in various global markets. The majority of our sales are transacted in U.S. dollars. However, we do generate revenues in other currencies, primarily the Euro, Japanese Yen, South Korean Won and Chinese Renminbi (RMB). As a result, our earnings, cash flows and cash balances are exposed to fluctuations in foreign currency exchange rates. We attempt to limit these exposures through financial market instruments. We utilize derivative instruments, primarily forward contracts with maturities of two months or less, to manage our exposure associated with anticipated cash flows and net asset and liability positions denominated in foreign currencies. Gains and losses on the forward contracts are mitigated by gains and losses on the underlying instruments. We do not use derivative financial instruments for speculative or trading purposes. The credit risk amounts represent the Company’s gross exposure to potential accounting loss on derivative instruments that are outstanding or unsettled if all counterparties failed to perform according to the terms of the contract, based on then-current currency rates at each respective date.

*Non-Designated Derivatives*

The outstanding notional contract and fair value asset (liability) amounts of non-designated hedge contracts, with maximum maturity of two months, are as follows (in thousands):

| | U.S. Notional Contract Value | | U.S. Fair Value | |
|---|---|---|---|---|
| | March 30, 2019 | September 29, 2018 | March 30, 2019 | September 29, 2018 |
| Euro currency hedge contracts | | | | |
| Purchase | **$ 40,755** | $ 126,589 | **$ (579)** | $ (1,554) |
| Sell | **$ (3,479)** | $ (8,701) | **$ 28** | 43 |
| Japanese Yen currency hedge contracts | | | | |
| Purchase | **$ —** | $ — | **$ —** | $ — |
| Sell | **$ (11,848)** | $ (27,473) | **$ 21** | $ 637 |
| South Korean Won currency hedge contracts | | | | |
| Purchase | **$ 781** | $ 2,778 | **$ (5)** | $ 27 |
| Sell | **$ (29,829)** | $ (31,920) | **$ 519** | $ (109) |
| Chinese RMB currency hedge contracts | | | | |
| Purchase | **$ 1,964** | $ 5,852 | **$ (1)** | $ (33) |
| Sell | **$ (26,419)** | $ (51,137) | **$ 67** | $ 300 |
| Singapore Dollar currency hedge contracts | | | | |
| Purchase | **$ 31,902** | $ 30,127 | **$ (126)** | $ (131) |
| Other foreign currency hedge contracts | | | | |
| Purchase | **$ 6,260** | $ 4,091 | **$ 5** | $ (13) |
| Sell | **$ (5,982)** | $ (5,934) | **$ 60** | $ (39) |

The fair value of our derivative instruments is included in prepaid expenses and other assets and in other current liabilities in our Condensed Consolidated Balance Sheets. See Note 5, "Fair Values."

During the three and six months ended March 30, 2019, we recognized losses of $3.0 million and $6.7 million, respectively, in other income (expense) for derivative instruments not designated as hedging instruments. During the three and six months ended March 31, 2018, we recognized a gain of $1.0 million and a loss of $1.6 million, respectively, in other income (expense) for derivative instruments not designated as hedging instruments.

*Master Netting Arrangements*

To mitigate credit risk in derivative transactions, we enter into master netting arrangements that allow each counterparty in the arrangements to net settle amounts of multiple and separate derivative transactions under certain conditions. We present the fair value of derivative assets and liabilities within our condensed consolidated balance sheet on a gross basis even when derivative transactions are subject to master netting arrangements and may otherwise qualify for net presentation. The impact of netting derivative assets and liabilities is not material to our financial position for any of the periods presented. Our derivative contracts do not contain any credit risk related contingent features and do not require collateral or other security to be furnished by us or the counterparties.

## 8. GOODWILL AND INTANGIBLE ASSETS

During the six months ended March 30, 2019, we noted no indications of impairment or triggering events to cause us to review goodwill for potential impairment. We will conduct our annual goodwill testing during the fourth fiscal quarter.

The changes in the carrying amount of goodwill by segment for the period from September 29, 2018 to March 30, 2019 are as follows (in thousands):

| | OEM Laser Sources | Industrial Lasers & Systems | Total |
|---|---|---|---|
| Balance as of September 29, 2018 | $ 100,732 | $ 342,208 | $ 442,940 |
| Additions (see Note 4) | — | 3,556 | 3,556 |
| Translation adjustments | (1,886) | (8,613) | (10,499) |
| Balance as of March 30, 2019 | $ 98,846 | $ 337,151 | $ 435,997 |

Components of our amortizable intangible assets are as follows (in thousands):

| | March 30, 2019 | | | September 29, 2018 | | |
|---|---|---|---|---|---|---|
| | Gross Carrying Amount | Accumulated Amortization | Net | Gross Carrying Amount | Accumulated Amortization | Net |
| Existing technology | $ 202,766 | $ (115,395) | $ 87,371 | $ 201,759 | $ (94,376) | $ 107,383 |
| Customer relationships | 43,092 | (19,056) | 24,036 | 50,359 | (22,383) | 27,976 |
| Trade name | 5,723 | (4,660) | 1,063 | 5,888 | (3,818) | 2,070 |
| Production know-how | 2,300 | (228) | 2,072 | — | — | — |
| In-process research & development | 4,716 | — | 4,716 | 4,864 | — | 4,864 |
| Total | $ 258,597 | $ (139,339) | $ 119,258 | $ 262,870 | $ (120,577) | $ 142,293 |

For accounting purposes, when an intangible asset is fully amortized, it is removed from the disclosure schedule.

The in-process research and development project is not expected to be completed in fiscal 2019.

Amortization expense for intangible assets for the six months ended March 30, 2019 and March 31, 2018 was $29.1 million and $30.4 million, respectively. The change in the accumulated amortization also includes $4.4 million (decrease) and $4.5 million (increase) of foreign exchange impact for the six months ended March 30, 2019 and March 31, 2018, respectively.

At March 30, 2019, estimated amortization expense for the remainder of fiscal 2019, the next five succeeding fiscal years and all fiscal years thereafter are as follows (in thousands):

| | Estimated Amortization Expense |
|---|---|
| 2019 (remainder) | $ 27,758 |
| 2020 | 48,652 |
| 2021 | 17,828 |
| 2022 | 6,786 |
| 2023 | 4,417 |
| 2024 | 3,071 |
| Thereafter | 6,030 |
| Total (excluding IPR&D) | $ 114,542 |

## 9. BALANCE SHEET DETAILS

Inventories consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Purchased parts and assemblies | **$ 143,637** | $ 137,566 |
| Work-in-process | **176,315** | 186,240 |
| Finished goods | **163,789** | 162,935 |
| Total inventories | **$ 483,741** | $ 486,741 |

Prepaid expenses and other assets consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Prepaid and refundable income taxes | **$ 39,539** | $ 37,884 |
| Other taxes receivable | **10,632** | 16,930 |
| Prepaid expenses and other assets | **29,294** | 30,266 |
| Total prepaid expenses and other assets | **$ 79,465** | $ 85,080 |

Other assets consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Assets related to deferred compensation arrangements | **$ 33,605** | $ 37,370 |
| Deferred tax assets | **64,065** | 64,858 |
| Other assets [(1)] | **11,844** | 9,521 |
| Total other assets | **$ 109,514** | $ 111,749 |

(1) In the first quarter of fiscal 2019, we invested 3.0 million Euro ($3.4 million) in 3D-Micromac AG, a company that specializes in laser micromachining. The investment is included in other assets and is being carried on a cost basis and will be adjusted, as necessary, for impairment.

Other current liabilities consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Accrued payroll and benefits | **$ 54,162** | $ 55,704 |
| Deferred revenue | **23,898** | 30,613 |
| Warranty reserve | **38,991** | 40,220 |
| Accrued expenses and other | **33,525** | 36,859 |
| Customer deposits | **13,377** | 19,933 |
| Total other current liabilities | **$ 163,953** | $ 183,329 |

Components of the reserve for warranty costs during the first six months of fiscal 2019 and 2018 were as follows (in thousands):

| | Six Months Ended | |
|---|---|---|
| | March 30, 2019 | March 31, 2018 |
| Beginning balance | **$ 40,220** | $ 36,149 |
| Additions related to current period sales | **27,816** | 24,290 |
| Warranty costs incurred in the current period | **(28,406)** | (24,212) |
| Accruals resulting from acquisitions | **21** | 179 |
| Adjustments to accruals related to foreign exchange and other | **(660)** | 1,073 |
| Ending balance | **$ 38,991** | $ 37,479 |

Other long-term liabilities consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Long-term taxes payable | **$ 36,341** | $ 36,336 |
| Deferred compensation | **37,313** | 40,895 |
| Defined benefit plan liabilities | **37,365** | 37,528 |
| Deferred tax liabilities | **16,605** | 26,339 |
| Deferred revenue | **5,514** | 5,091 |
| Asset retirement obligations liability | **4,656** | 4,529 |
| Other long-term liabilities | **957** | 1,238 |
| Total other long-term liabilities | **$ 138,751** | $ 151,956 |

## 10. BORROWINGS

On November 7, 2016 (the "Closing Date"), we entered into a Credit Agreement by and among us, Coherent Holding BV & Co. K.G. (formerly Coherent Holding GmbH), as borrower (the "Borrower"), and certain of our direct and indirect subsidiaries from time to time party thereto, as guarantors, the lenders from time to time party thereto, Barclays Bank PLC, as administrative agent and an L/C Issuer, Bank of America, N.A., as an L/C Issuer, and MUFG Union Bank, N.A., as an L/C Issuer (the "Initial Credit Agreement" and, as amended by the Amendments (defined below), the "Credit Agreement"). The Initial Credit Agreement provided for a 670.0 million Euro senior secured term loan facility (the "Euro Term Loan") and a $100.0 million senior secured revolving credit facility (the "Revolving Credit Facility") with a $30.0 million letter of credit sublimit and a $10.0 million swing line sublimit, in each case, which may be increased from time to time pursuant to an incremental feature set forth in the Credit Agreement. On November 7, 2016, the Borrower borrowed the full 670.0 million Euros under the Euro Term Loan and its proceeds were used to finance the acquisition of Rofin and pay related fees and expenses. On November 7, 2016, we also used 10.0 million Euros of the capacity under the Revolving Credit Facility for the issuance of a letter of credit. On November 20, 2018, we borrowed an additional $40.0 million under the Revolving Credit Facility. The Initial Credit Agreement was amended on May 8, 2017 (the "First Amendment") to reduce the interest rate margins applicable to the Euro Term Loan and was amended again on July 5, 2017 (the "Second Amendment" and, together with the First Amendment, the "Amendments") to make certain technical changes in connection with the conversion of the Borrower from a German company with limited liability to a German limited partnership.

The Credit Agreement contains customary mandatory prepayment provisions. The Borrower has the right to prepay loans under the Credit Agreement in whole or in part at any time without premium or penalty, subject to customary breakage costs. Revolving loans may be borrowed, repaid and reborrowed until the fifth anniversary of the Closing Date, at which time all outstanding revolving loans must be repaid. The Euro Term Loan matures on the seventh anniversary of the Closing Date, at which time all outstanding principal and accrued and unpaid interest on the Euro Term Loan must be repaid.

As of March 30, 2019, the outstanding principal amount of the Euro Term Loan was 368.3 million Euros. As of March 30, 2019, the outstanding amount of the Revolving Credit Facility was $40.0 million plus a 10.0 million Euro letter of credit.

Loans under the Credit Agreement bear interest, at the Borrower’s option, at a rate equal to either (i)(x) in the case of calculations with respect to U.S. Dollars or certain other alternative currencies, the London interbank offered rate (the "LIBOR") or (y) in the case of calculations with respect to the Euro, the euro interbank offered rate ("EURIBOR" and, together with LIBOR), the "Eurocurrency Rate") or (ii) a base rate (the "Base Rate") equal to the highest of (x) the federal funds rate, plus 0.50%, (y) the prime rate then in effect and (z) the Eurocurrency Rate for loans denominated in U.S. dollars applicable to a one-month interest period, plus 1.0%, in each case, plus an applicable margin that is subject to adjustment pursuant to a pricing grid based on consolidated total gross leverage ratio. At March 30, 2019, the applicable margin for Euro Term Loans borrowed as Eurocurrency Rate loans was 2.00% per annum and as Base Rate loans was 1.00% and the applicable margin for revolving loans borrowed as Eurocurrency Rate loans was 3.75% per annum and as Base Rate loans was 2.75% per annum. Interest on Base Rate Loans is payable quarterly in arrears. Interest on Eurocurrency Rate loans is payable at the end of the applicable interest period (or at three month intervals if the interest period exceeds three months).

The Credit Agreement requires the Borrower to make scheduled quarterly payments on the Euro Term Loan of 0.25% of the original principal amount of the Euro Term Loan, with any remaining principal payable at maturity. A commitment fee accrues on any unused portion of the revolving loan commitments under the Credit Agreement at a rate of 0.375% or 0.5% depending on the consolidated total gross leverage ratio at any time of determination. The Borrower is also obligated to pay other customary fees for a credit facility of this size and type.

On the Closing Date, we and certain of our direct and indirect subsidiaries, as guarantors, provided an unconditional guaranty of all obligations of the Borrower and the other loan parties arising under the Credit Agreement, the other loan documents and under swap contracts and treasury management agreements with the lenders or their affiliates (with certain limited exceptions). The Borrower and the guarantors have also granted security interests in substantially all of their assets to secure such obligations.

The Credit Agreement contains customary affirmative and negative covenants, including covenants limiting the ability of us and our subsidiaries to, among other things, incur debt, grant liens, make investments, make certain restricted payments, transact with affiliates, and sell assets. The Credit Agreement also requires us and our subsidiaries to maintain a senior secured net leverage ratio as of the last day of each fiscal quarter of less of than or equal to 3.50 to 1.00. We were in compliance with all covenants at March 30, 2019.

We incurred $28.5 million of debt issuance costs related to the Euro Term Loan and $0.5 million of debt issuance costs to the original lenders related to the First Amendment, which are included in short-term borrowings and current portion of long-term obligations and long-term obligations in the condensed consolidated balance sheets and will be amortized to interest expense over the seven year life of the Euro Term Loan using the effective interest method, adjusted to accelerate amortization related to voluntary repayments. We incurred $2.3 million of debt issuance costs in connection with the Revolving Credit Facility which were capitalized and included in prepaid expenses and other assets and other assets in the condensed consolidated balance sheets and will be amortized to interest expense using the straight-line method over the contractual term of five years of the Revolving Credit Facility.

Additional sources of cash available to us were international currency lines of credit and bank credit facilities totaling $26.2 million as of March 30, 2019, of which $17.1 million was unused and available. These unsecured international credit facilities were used in Europe and Japan during the first six months of fiscal 2019. As of March 30, 2019, we had utilized $7.8 million of the international credit facilities as guarantees in Europe and $1.3 million of the international credit facilities as borrowings in Japan.

Short-term borrowings and current portion of long-term obligations consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Current portion of Euro Term Loan (1) | **$ 3,038** | $ 3,092 |
| 1.3% Term loan due 2024 | **1,404** | 1,448 |
| 1.0% State of Connecticut term loan due 2023 | **376** | 374 |
| OR Laser loans | **118** | 158 |
| Capital lease obligations | **741** | — |
| Line of credit borrowings | **41,302** | — |
| Total short-term borrowings and current portion of long-term obligations | **$ 46,979** | $ 5,072 |

(1) Net of debt issuance costs of $4.5 million and $4.7 million at March 30, 2019 and September 29, 2018, respectively.

Long-term obligations consist of the following (in thousands):

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| Euro Term Loan due 2024 (1) | **$ 397,557** | $ 411,661 |
| 1.3% Term loan due 2024 | **6,319** | 7,242 |
| 1.0% State of Connecticut term loan due 2023 | **1,217** | 1,406 |
| OR Laser loans | **329** | 402 |
| Capital lease obligations | **415** | — |
| Total long-term obligations | **$ 405,837** | $ 420,711 |

(1) Net of debt issuance costs of $8.6 million and $11.2 million at March 30, 2019 and September 29, 2018, respectively.

Contractual maturities of our debt obligations, excluding line of credit borrowings, as of March 30, 2019 are as follows (in thousands):

| | Amount |
|---|---|
| 2019 (remainder) | $ 5,323 |
| 2020 | 9,684 |
| 2021 | 9,683 |
| 2022 | 9,431 |
| 2023 | 9,265 |
| 2024 | 381,226 |
| Total | $ 424,612 |

## 11. STOCK-BASED COMPENSATION

### Fair Value of Stock Compensation

We recognize compensation expense for all share based payment awards based on the fair value of such awards. The expense is recognized on a straight-line basis per tranche over the respective requisite service period of the awards.

### Determining Fair Value

The fair values of shares purchased under the Employee Stock Purchase Plan ("ESPP") for the three and six months ended March 30, 2019 and March 31, 2018, respectively, were estimated using the following weighted-average assumptions:

| | Employee Stock Purchase Plan | | | |
|---|---|---|---|---|
| | Three Months Ended | | Six Months Ended | |
| | March 30, 2019 | March 31, 2018 | March 30, 2019 | March 31, 2018 |
| Expected life in years | **0.5** | 0.5 | **0.5** | 0.5 |
| Volatility | **47.5%** | 51.8% | **47.9%** | 50.0% |
| Risk-free interest rate | **2.49%** | 1.30% | **2.42%** | 1.26% |
| Expected dividend yield | **—%** | —% | **—%** | —% |
| Weighted average fair value per share | **$ 38.50** | $ 76.30 | **40.64** | $ 73.64 |

We grant performance restricted stock units to officers and certain employees. The performance restricted stock unit agreements provide for the award of performance stock units with each unit representing the right to receive one share of our common stock to be issued after the applicable award vesting period. The final number of units awarded, if any, for these performance grants will be determined as of the vesting dates, based upon our total shareholder return over the performance period compared to the applicable Russell Index and could range from no units to a maximum of twice the initial award units. The weighted average fair value for these performance units was determined using a Monte Carlo simulation model incorporating the following weighted average assumptions:

| | Six Months Ended | |
|---|---|---|
| | March 30, 2019 | March 31, 2018 |
| Risk-free interest rate | **2.9%** | 1.7% |
| Volatility | **43.7%** | 37.0% |
| Weighted average fair value per share | **$ 117.43** | $ 315.05 |

We recognize the estimated cost of these awards, as determined under the simulation model, over the related service period of approximately 3 years, with no adjustment in future periods based upon the actual shareholder return over the performance period.

### Stock Compensation Expense

The following table shows total stock-based compensation expense and related tax benefits included in the condensed consolidated statements of operations for the three and six months ended March 30, 2019 and March 31, 2018 (in thousands):

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | March 30, 2019 | March 31, 2018 | March 30, 2019 | March 31, 2018 |
| Cost of sales | **$ 1,172** | $ 1,018 | **$ 2,409** | $ 2,006 |
| Research and development | **783** | 872 | **1,433** | 1,540 |
| Selling, general and administrative | **7,049** | 6,520 | **13,038** | 11,940 |
| Income tax benefit | **(1,461)** | (1,175) | **(2,694)** | (2,784) |
| | **$ 7,543** | $ 7,235 | **$ 14,186** | $ 12,702 |

During the three and six months ended March 30, 2019, $1.3 million and $2.4 million of stock-based compensation cost, respectively, were capitalized as part of inventory for all stock plans, $1.2 million and $2.4 million, respectively, were amortized into cost of sales and $1.5 million remained in inventory at March 30, 2019. During the three and six months ended March 31, 2018, $1.2 million and $2.2 million of stock-based compensation, respectively, were capitalized as part of inventory for all stock plans, $1.0 million and $2.0 million, respectively, were amortized into cost of sales and $1.4 million remained in inventory at March 31, 2018.

At March 30, 2019, the total compensation cost related to unvested stock-based awards granted to employees under our stock plans but not yet recognized was approximately $45.4 million. We do not estimate forfeitures. This cost will be amortized on a straight-line basis over a weighted-average period of approximately 1.5 years.

### Stock Awards Activity

The following table summarizes the activity of our time-based and performance restricted stock units for the first six months of fiscal 2019 (in thousands, except per share amounts):

| | Time Based Restricted Stock Units | | Performance Restricted Stock Units | |
|---|---|---|---|---|
| | Number of Shares | Weighted Average Grant Date Fair Value | Number of Shares | Weighted Average Grant Date Fair Value |
| Nonvested stock at September 29, 2018 | 279 | $ 155.24 | 159 | $ 155.76 |
| Granted | 164 | 124.17 | 104 | 117.43 |
| Vested [(1)] | (168) | 127.22 | (130) | 74.48 |
| Forfeited | (6) | 177.46 | — | — |
| Nonvested stock at March 30, 2019 | 269 | $ 153.22 | 133 | $ 184.26 |

(1) Service-based restricted stock units vested during the fiscal year. Performance-based restricted stock units included at 100% of target goal; under the terms of the awards, the recipient may earn between 0% and 200% of the award.

## 12. COMMITMENTS AND CONTINGENCIES

### Indemnifications

In the normal course of business, we enter into agreements that contain a variety of representations and warranties and provide for general indemnification. Exposure under these agreements is unknown because claims may be made against us in the future and we may record charges in the future as a result of these indemnification obligations. As of March 30, 2019, we did not have any material indemnification claims that were probable or reasonably possible.

**Legal Proceedings**

We are subject to legal claims and litigation arising in the ordinary course of business, such as product liability, employment or intellectual property claims, including, but not limited to, the matters described below.

On May 14, 2013, IMRA America ("Imra") filed a complaint alleging patent infringement against two of our subsidiaries in the Regional Court of Düsseldorf, Germany. Our subsidiaries subsequently filed a separate nullity action with the Federal Patent Court in Munich, Germany, requesting that the court hold that the patent in question was invalid based on prior art. The court found the patent to be invalid, and Imra appealed the decision to the Federal Court of Justice, the highest civil jurisdiction court in Germany. The Federal Court of Justice dismissed the appeal on March 27, 2018, effectively ending the case in favor of Coherent. In addition, as of April 3, 2019, all of the involved courts had finalized the granting of costs and statutory attorneys' fees to Coherent of an aggregate amount of approximately $0.1 million.

Although we do not expect that such legal claims and litigation will ultimately have a material adverse effect on our consolidated financial position, results of operations or cash flows, an adverse result in one or more matters could negatively affect our results in the period in which they occur.

The United States and many foreign governments impose tariffs and duties on the import and export of certain products we sell. From time to time our customs compliance, product classifications, duty calculations and payments are reviewed or audited by government agencies. Any adverse result in such a review or audit could negatively affect our results in the period in which they occur.

We are currently in discussions with the German government regarding an export compliance matter by one of our German subsidiaries. We believe that this involves less than approximately 1.5 million Euros in transactions over the past three years and do not believe that the final resolution of this matter will be material to our consolidated financial position, results of operations or cash flows. However, the German government investigation is ongoing and it is possible that substantial payments, fines and/or penalties or damages could result. Even though we do not currently expect this matter to be material to our consolidated financial position, results of operations or cash flows, circumstances could change as the investigation progresses.

## 13. STOCK REPURCHASES

On February 6, 2018, our board of directors authorized a stock repurchase program authorizing the Company to repurchase up to $100.0 million of our common stock from time to time through January 31, 2019. During fiscal 2018, we repurchased and retired 574,946 shares of outstanding common stock under this program at an average price of $173.91 per share for a total of $100.0 million.

On October 28, 2018, our board of directors authorized a stock repurchase program authorizing the Company to repurchase up to $250.0 million of our common stock through December 31, 2019, with a limit of no more than $75.0 million per quarter. During the second quarter of fiscal 2019, we repurchased and retired 199,826 shares of outstanding common stock under this program at an average price of $129.64 per share for a total of $25.9 million. During the first six months of fiscal 2019, we repurchased and retired 394,627 shares of outstanding common stock under this program at an average price of $130.26 per share for a total of $51.4 million.

## 14. EARNINGS PER SHARE

Basic earnings per share is computed based on the weighted average number of shares outstanding during the period, excluding unvested restricted stock. Diluted earnings per share is computed based on the weighted average number of shares outstanding during the period increased by the effect of dilutive employee stock awards, including stock options, restricted stock awards and stock purchase plan contracts, using the treasury stock method.

The following table presents information necessary to calculate basic and diluted earnings per share (in thousands, except per share data):

| | Three Months Ended | | | Six Months Ended | | | |
|---|---|---|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | | March 30, 2019 | | March 31, 2018 |
| Weighted average shares outstanding—basic | | **24,232** | | 24,761 | | **24,250** | 24,698 |
| Dilutive effect of employee stock awards | | **100** | | 249 | | **152** | 320 |
| Weighted average shares outstanding—diluted | | **24,332** | | 25,010 | | **24,402** | 25,018 |
| | | | | | | | |
| **Net income from continuing operations** | **$** | **20,750** | $ | 65,302 | **$** | **56,300** | $ 107,205 |
| Loss from discontinued operations, net of income taxes | | **—** | | — | | **—** | (2) |
| **Net income** | **$** | **20,750** | $ | 65,302 | **$** | **56,300** | $ 107,203 |

A total of 88,032 and 92,837 potentially dilutive securities have been excluded from the diluted share calculation for the three and six months ended March 30, 2019, respectively, as their effect was anti-dilutive.

A total of 32,221 and 25,864 potentially dilutive securities have been excluded from the diluted share calculation for the three and six months ended March 31, 2018, respectively, as their effect was anti-dilutive.

## 15. OTHER INCOME (EXPENSE)

Other income (expense) is as follows (in thousands):

| | Three Months Ended | | | | Six Months Ended | | | |
|---|---|---|---|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | | March 30, 2019 | | March 31, 2018 | |
| Foreign exchange loss | **$** | **(2,371)** | $ | (3,175) | **$** | **(4,548)** | $ | (5,410) |
| Gain (loss) on deferred compensation investments, net | | **1,183** | | 721 | | **(941)** | | 2,575 |
| Other | | **1,437** | | 229 | | **1,260** | | 386 |
| Other—net | **$** | **249** | $ | (2,225) | **$** | **(4,229)** | $ | (2,449) |

## 16. INCOME TAXES

Income tax expense includes a provision for federal, state and foreign taxes based on the annual estimated effective tax rate applicable to us and our subsidiaries, adjusted for items which are considered discrete to the period.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted. The Tax Act contains significant changes to U.S. tax law, including lowering the U.S. corporate income tax rate to 21.0% and implementing a territorial tax system. The Securities Exchange Commission issued guidance under Staff Accounting Bulletin No. 118 ("SAB 118") directing taxpayers to record the impact of the Tax Act as "provisional" when they do not have all the necessary information to complete the accounting under ASC 740. The guidance allows for a measurement period of up to one year after the enactment date of the Tax Act to finalize the recording of the related tax impact. In accordance with SAB 118, we recorded provisional estimates to our consolidated financial statements in fiscal 2018 based on the Tax Act. During the first and second quarters of fiscal 2019, we further analyzed the income tax effects of the Tax Act and there were no material changes to the provisional amounts disclosed in our fiscal 2018 financial statements. Although our accounting for the effects of the Tax Act is complete under SAB 118, there may be future adjustments based on changes in interpretations of the Tax Act, any legislative updates or final regulations under the Tax Act, any changes in accounting standards for income taxes or related interpretations or any updates or changes in estimates we have utilized to calculate the transitional impact.

The Tax Act also made other significant changes to U.S. federal income tax laws, including a global intangible low-taxed income tax (GILTI) and a base erosion anti-abuse tax (BEAT) which became effective for us beginning on September 30, 2018. Currently, we do not expect GILTI and BEAT to have a material impact on our results of operations.

Our effective tax rates on income from continuing operations before income taxes for the three and six months ended March 30, 2019 were 15.7% and 17.5%, respectively. Our effective tax rates for the three and six months ended March 30, 2019 were lower than the U.S. federal tax rate of 21.0% primarily due to the excess tax benefits from restricted stock unit vesting, the benefit of federal research and development tax credits and our Singapore and South Korea tax exemptions. These amounts are partially offset by the impact of income subject to foreign tax rates that are higher than the U.S. tax rates, an accrual for foreign withholding taxes on certain current year foreign earnings not considered permanently reinvested, stock-based compensation not deductible for tax purposes and limitations on the deductibility of compensation under IRC Section 162(m).

Our effective tax rates on income from continuing operations before income taxes for the three and six months ended March 31, 2018 were 28.4% and 44.2%, respectively. Our effective tax rate for the three months ended March 31, 2018 was higher than the effective U.S. federal blended tax rate of 24.5% primarily due to the impact of income subject to foreign tax rates that are higher than U.S. tax rates. This amount is partially offset by the benefit of foreign tax credits, the benefit of federal research and development tax credits, the benefit of a domestic manufacturing deduction under IRC Section 199 and our Singapore tax exemption. Our effective tax rate for the six months ended March 31, 2018 was higher than the effective U.S. federal blended tax rate of 24.5% primarily due to the Tax Act's one-time mandatory deemed repatriation transition tax, the impact of income subject to foreign tax rates that are higher than U.S. tax rates, the remeasurement of deferred tax assets and liabilities based on the newly enacted U.S. federal tax rate of 21.0%, stock-based compensation not deductible for tax purposes and limitations on the deductibility of compensation under IRC Section 162(m). These amounts are partially offset by the excess tax benefits from stock award exercises and restricted stock unit vesting, the benefit of foreign tax credits, the benefit of federal research and development tax credits, the benefit of a domestic manufacturing deduction under IRC Section 199 and our Singapore tax exemption.

In March 2019, Coherent Korea Ltd. received an additional High-Tech tax exemption from the South Korean authorities. The High-Tech tax exemption is effective retroactively to the beginning of fiscal 2019.

## 17. DEFINED BENEFIT PLANS

For the three and six months ended March 30, 2019, net periodic cost (benefit) under our defined benefit plans was a benefit of $0.4 million and cost of $0.2 million, respectively. For the three and six months ended March 31, 2018, net periodic cost under our defined benefit plans was $0.0 million and $0.5 million, respectively. The service cost component of net periodic costs is included in selling, general and administrative ("SG&A") expenses, and the interest costs, net actuarial (gain) loss and other components are included in Other—net in the condensed consolidated statements of operations.

## 18. SEGMENT AND GEOGRAPHIC INFORMATION

At March 30, 2019, we were organized into two reporting segments, OEM Laser Sources ("OLS") and Industrial Lasers & Systems ("ILS"), based upon our organizational structure and how the CODM receives and utilizes information provided to allocate resources and make decisions. This segmentation reflects the go-to-market strategies and synergies for our broad portfolio of laser technologies and products. While both segments deliver cost-effective, highly reliable photonics solutions, the OLS business segment is focused on high performance laser sources and complex optical sub-systems, typically used in microelectronics manufacturing, medical diagnostics and therapeutic medical applications, as well as in scientific research. Our ILS business segment delivers high performance laser sources, sub-systems and tools primarily used for industrial laser materials processing, serving important end markets like automotive, machine tool, consumer goods and medical device manufacturing. Ondax's and OR Laser's operating results have been included in our ILS segment.

We have identified OLS and ILS as operating segments for which discrete financial information is available. Both units have dedicated engineering, manufacturing, product business management and product line management functions. A small portion of our outside revenue is attributable to projects and recently developed products for which a segment has not yet been determined. The associated direct and indirect costs are presented in the category of Corporate and other, along with other corporate costs as described below.

Our Chief Executive Officer has been identified as the CODM, as he assesses the performance of the segments and decides how to allocate resources to the segments. Income from continuing operations is the measure of profit and loss that our

CODM uses to assess performance and make decisions. As assets are not a measure used to assess the performance of the company by the CODM, asset information is not tracked or compiled by segment and is not available to be reported in our disclosures. Income from continuing operations represents the net sales less the cost of sales and direct operating expenses incurred within the operating segments as well as allocated expenses such as shared sales and manufacturing costs. We do not allocate to our operating segments certain operating expenses which we manage separately at the corporate level. These unallocated costs include stock-based compensation and corporate functions (certain research and development, management, finance, legal and human resources) and are included in the results below under Corporate and other in the reconciliation of operating results. Management does not consider unallocated Corporate and other costs in its measurement of segment performance.

The following table provides net sales and income from continuing operations for our operating segments and a reconciliation of our total income from continuing operations to income from continuing operations before income taxes (in thousands):

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | **March 30, 2019** | **March 31, 2018** | **March 30, 2019** | **March 31, 2018** |
| Net sales: | | | | |
| OEM Laser Sources | **$ 231,597** | $ 317,138 | **$ 473,945** | $ 642,795 |
| Industrial Lasers & Systems | **141,263** | 163,980 | **282,061** | 315,888 |
| Total net sales | **$ 372,860** | $ 481,118 | **$ 756,006** | $ 958,683 |
| | | | | |
| Income (loss) from continuing operations: | | | | |
| OEM Laser Sources | **$ 62,835** | $ 117,120 | **$ 141,693** | $ 244,837 |
| Industrial Lasers & Systems | **(17,652)** | 1,173 | **(31,357)** | 2,385 |
| Corporate and other | **(16,316)** | (17,632) | **(28,658)** | (37,238) |
| Total income from continuing operations | **28,867** | 100,661 | **81,678** | 209,984 |
| Total other income (expense), net | **(4,252)** | (9,510) | **(13,403)** | (18,010) |
| Income from continuing operations before income taxes | **$ 24,615** | $ 91,151 | **$ 68,275** | $ 191,974 |

**Geographic Information**

Our foreign operations consist primarily of manufacturing facilities and sales offices in Europe and Asia-Pacific. Sales, marketing and customer service activities are conducted through sales subsidiaries throughout the world. Geographic sales information for the three and six months ended March 30, 2019 and March 31, 2018 is based on the location of the end customer.

Sales to unaffiliated customers are as follows (in thousands):

| SALES | Three months ended March 30, 2019 | Three months ended March 31, 2018 | Six months ended March 30, 2019 | Six months ended March 31, 2018 |
|---|---|---|---|---|
| United States | **$ 84,179** | $ 76,908 | **$ 168,210** | $ 148,852 |
| Foreign countries: | | | | |
| South Korea | **63,201** | 158,479 | **169,726** | 336,846 |
| China | **47,071** | 46,819 | **94,615** | 124,323 |
| Europe, other | **40,388** | 48,245 | **76,678** | 88,749 |
| Japan | **60,745** | 57,705 | **90,582** | 87,325 |
| Germany | **40,952** | 43,926 | **78,836** | 79,921 |
| Asia-Pacific, other | **20,918** | 33,065 | **48,147** | 63,047 |
| Rest of World | **15,406** | 15,971 | **29,212** | 29,620 |
| Total foreign countries sales | **288,681** | 404,210 | **587,796** | 809,831 |
| Total sales | **$ 372,860** | $ 481,118 | **$ 756,006** | $ 958,683 |

**Major Customers**

We had one customer during the three and six months ended March 30, 2019 that accounted for 13.7% and 16.1% of net sales, respectively. The same customer accounted for 22.3% and 27.5% of net sales for the three and six months ended March 31, 2018, respectively. We had another customer during the three months ended March 30, 2019 that accounted for 12.2% of net sales. These customers purchased primarily from our OLS segment.

We had one customer that accounted for 21.0% and 16.4% of accounts receivable at March 30, 2019 and September 29, 2018, respectively. We had another customer that accounted for 13.7% of accounts receivable at March 30, 2019. We had a third customer that accounted for 16.7% of accounts receivable at September 29, 2018. These customers purchased primarily from our OLS segment.

## 19. RESTRUCTURING CHARGES

In the first quarter of fiscal 2017, we began the implementation of planned restructuring activities in connection with the acquisition of Rofin. These activities primarily relate to exiting our legacy high power fiber laser product line, change of control payments to Rofin officers, the exiting of two product lines acquired in the acquisition of Rofin, realignment of our supply chain due to segment reorganization and consolidation of sales and distribution offices as well as certain manufacturing sites. These activities resulted in charges primarily for employee termination, other exit related costs associated with the write-off of property and equipment and inventory and early lease termination costs.

The following table presents our current liability as accrued on our balance sheets for restructuring charges. The table sets forth an analysis of the components of the restructuring charges and payments and other deductions made against the accrual for the first three and six months of fiscal 2019 and 2018 (in thousands):

| | Severance Related | Asset Write-Offs | Other | Total |
|---|---|---|---|---|
| Balances, September 29, 2018 | $ 836 | $ — | $ 286 | $ 1,122 |
| Provision | 212 | 76 | 188 | 476 |
| Payments and other | (447) | (76) | (244) | (767) |
| Balances, December 29, 2018 | 601 | — | 230 | 831 |
| Provision | 282 | 247 | 351 | 880 |
| Payments and other | (201) | (247) | (516) | (964) |
| Balances, March 30, 2019 | $ 682 | $ — | $ 65 | $ 747 |

| | Severance Related | Asset Write-Offs | Other | Total |
|---|---|---|---|---|
| Balances, September 30, 2017 | $ 1,301 | $ — | $ — | $ 1,301 |
| Provision | 629 | 430 | 105 | 1,164 |
| Payments and other | (755) | (430) | (105) | (1,290) |
| Balances, December 30, 2017 | 1,175 | — | — | 1,175 |
| Provision | 599 | 9 | 118 | 726 |
| Payments and other | (841) | (9) | (118) | (968) |
| Balances, March 31, 2018 | $ 933 | $ — | $ — | $ 933 |

At March 30, 2019, $0.7 million of accrued severance related costs were included in other current liabilities. The severance related, asset write-offs of equipment and other costs in the first three and six months of fiscal 2019 and 2018 related to the consolidation of certain manufacturing sites.

In the three and six months ended March 30, 2019, all of the restructuring costs were incurred in the ILS segment and none were incurred in the OLS segment. By segment, $0.6 million and $1.0 million of restructuring costs were incurred in the ILS segment and $0.1 million and $0.9 million were incurred in the OLS segment in the three and six months ended March 31, 2018, respectively. Restructuring charges are recorded in cost of sales, research and development and selling, general and administrative expenses in our condensed consolidated statements of operations.

## 20. DISCONTINUED OPERATIONS AND SALE OF ASSETS HELD FOR SALE

### Discontinued Operations

Discontinued operations are from the Hull Business that we acquired as part of our acquisition of Rofin. As a condition of the acquisition, we were required to divest and hold separate the Hull Business and reported this business separately as a discontinued operation until its divestiture. We completed the divestiture of the Hull Business on October 11, 2017, after receiving approval for the terms of the sale from the European Commission. As a result of the divestiture, we recorded a loss in discontinued operations of $2,000 in the first quarter of fiscal 2018. For financial statement purposes, the results of operations for this discontinued business have been segregated from those of the continuing operations and are presented in our condensed consolidated financial statements as discontinued operations. The results from discontinued operations in the first quarter of fiscal 2018 to the date of divestiture (October 11, 2017) were immaterial and were not included in our condensed consolidated results of operations.

### Sale of Assets Held for Sale

In the fourth quarter of fiscal 2017, management decided to sell several entities that we acquired in the Rofin acquisition. Although the sale was not completed as of the end of fiscal 2017, we recorded a non-cash impairment charge of $2.9 million to operating expense in our results of operations in the fourth quarter of fiscal 2017 to reduce our carrying value in these entities to fair value. In the first and second quarters of fiscal 2018, we recorded additional non-cash impairment charges (recoveries) of $0.3 million and $(0.5) million, respectively, to operating expense in our results of operations to reduce our carrying value in these entities to fair value. On April 27, 2018, we completed the sale of these entities acquired in the Rofin acquisition in exchange for cash of $6.3 million and we recognized an additional loss on the sale of $0.5 million in the third quarter of fiscal 2018, for a net loss of $0.3 million in fiscal 2018 related to the sale and impairment of these entities.

## ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

## COMPANY OVERVIEW

### BUSINESS BACKGROUND

We are one of the world's leading providers of lasers, laser-based technologies and laser-based system solutions in a broad range of commercial, industrial and scientific applications. We design, manufacture, service and market lasers and related accessories for a diverse group of customers. Since inception in 1966, we have grown through internal expansion and through strategic acquisitions of complementary businesses, technologies, intellectual property, manufacturing processes and product offerings.

We are organized into two reporting segments: OEM Laser Sources ("OLS") and Industrial Lasers & Systems ("ILS"), based on the organizational structure of the company and how the chief operating decision maker ("CODM") receives and utilizes information provided to allocate resources and make decisions. This segmentation reflects the go-to-market strategies and synergies for our broad portfolio of laser technologies and products. While both segments deliver cost-effective, highly reliable photonics solutions, the OLS business segment is focused on high performance laser sources and complex optical sub-systems typically used in microelectronics manufacturing, medical diagnostics and therapeutic medical applications, as well as in scientific research. Our ILS business segment delivers high performance laser sources, sub-systems and tools primarily used for industrial laser materials processing, serving important end markets like automotive, machine tool, consumer goods and medical device manufacturing.

Income from continuing operations is the measure of profit and loss that our CODM uses to assess performance and make decisions. Income from continuing operations represents the sales less the cost of sales and direct operating expenses incurred within the operating segments as well as allocated expenses such as shared sales and manufacturing costs. We do not allocate to our operating segments certain operating expenses, which we manage separately at the corporate level. These unallocated costs include stock-based compensation and corporate functions (certain advanced research and development, management, finance, legal and human resources) and are included in Corporate and other. Management does not consider unallocated Corporate and other costs in its measurement of segment performance.

### MARKET APPLICATIONS

Our products address a broad range of applications that we group into the following markets: Microelectronics, Materials Processing, OEM Components and Instrumentation and Scientific Research and Government Programs.

### OUR STRATEGY

We strive to develop innovative and proprietary products and solutions that meet the needs of our customers and that are based on our core expertise in lasers and optical technologies. In pursuit of our strategy, we intend to:

- **Leverage our technology portfolio and application engineering to lead the proliferation of photonics into broader markets**—We will continue to identify opportunities in which our technology portfolio and application engineering can be used to offer innovative solutions and gain access to new markets. We plan to utilize our expertise to increase our market share in the mid to high power material processing applications.

- **Streamline our manufacturing structure and improve our cost structure**—We will focus on optimizing the mix of products that we manufacture internally and externally. We will utilize vertical integration where our internal manufacturing process is considered proprietary and seek to leverage external sources when the capabilities and cost structure are well developed and on a path towards commoditization.

- **Focus on long-term improvement of adjusted EBITDA, in dollars and as a percentage of net sales**—We define adjusted EBITDA as operating income adjusted for depreciation, amortization, stock compensation expense, major restructuring costs and certain other non-operating income and expense items, such as costs related to our acquisitions. Key initiatives to reach our goals for EBITDA improvements include utilization of our Asian manufacturing locations, optimizing our supply chain and continued leveraging of our infrastructure.

- **Optimize our leadership position in existing markets**—There are a number of markets where we have historically been at the forefront of technological development and product deployment and from which we have derived a substantial portion of our revenues. We plan to optimize our financial returns from these markets.

- **Maintain and develop additional strong collaborative customer and industry relationships**—We believe that the Coherent brand name and reputation for product quality, technical performance and customer satisfaction will help us to further develop our loyal customer base. We plan to maintain our current customer relationships and develop new ones with customers who are industry leaders and work together with these customers to design and develop innovative product systems and solutions as they develop new technologies.

- **Develop and acquire new technologies and market share**—We will continue to enhance our market position through our existing technologies and develop new technologies through our internal research and development efforts, as well as through the acquisition of additional complementary technologies, intellectual property, manufacturing processes and product offerings.

## APPLICATION OF CRITICAL ACCOUNTING POLICIES

Our discussion and analysis of financial condition and results of operations are based upon our condensed consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America and pursuant to the rules and regulations of the SEC. The preparation of these condensed consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. We have identified the following as the items that require the most significant judgment and often involve complex estimation: revenue recognition, business combinations, accounting for long-lived assets (including goodwill and intangible assets), inventory valuation, warranty reserves and accounting for income taxes. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for our fiscal year ended September 29, 2018 and Note 1, "Basis of Presentation" in the Notes to Condensed Consolidated Financial Statements.

## KEY PERFORMANCE INDICATORS

Below is a summary of some of the quantitative performance indicators (as defined below) that are evaluated by management to assess our financial performance. Some of the indicators are non-GAAP measures and should not be considered as an alternative to any other measure for determining operating performance or liquidity that is calculated in accordance with generally accepted accounting principles.

| | Three Months Ended | | | |
|---|---|---|---|---|
| | **March 30, 2019** | **March 31, 2018** | **Change** | **% Change** |
| | | **(Dollars in thousands)** | | |
| Net sales—OEM Laser Sources | **$ 231,597** | $ 317,138 | $ (85,541) | (27.0)% |
| Net sales—Industrial Lasers & Systems | **$ 141,263** | $ 163,980 | $ (22,717) | (13.9)% |
| Gross profit as a percentage of net sales—OEM Laser Sources | **46.6%** | 53.2% | (6.6)% | |
| Gross profit as a percentage of net sales—Industrial Lasers & Systems | **17.0%** | 29.2% | (12.2)% | |
| Research and development as a percentage of net sales | **8.2%** | 7.2% | 1.0 % | |
| Income from continuing operations before income taxes | **$ 24,615** | $ 91,151 | $ (66,536) | (73.0)% |
| Net cash provided by operating activities | **$ 75,012** | $ 67,819 | $ 7,193 | 10.6 % |
| Days sales outstanding in receivables | **75.6** | 58.5 | 17.1 | |
| Annualized second quarter inventory turns | **2.0** | 2.2 | (0.2) | |
| Capital spending as a percentage of net sales | **4.9%** | 4.4% | 0.5 % | |
| Net income from continuing operations as a percentage of net sales | **5.6%** | 13.6% | (8.0)% | |
| Adjusted EBITDA as a percentage of net sales | **18.2%** | 29.0% | (10.8)% | |

| | Six Months Ended | | | | | | |
|---|---|---|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | | Change | | % Change |
| | | | (Dollars in thousands) | | | | |
| Net sales—OEM Laser Sources | **$** | **473,945** | $ | 642,795 | $ | (168,850) | (26.3)% |
| Net sales—Industrial Lasers & Systems | **$** | **282,061** | $ | 315,888 | $ | (33,827) | (10.7)% |
| Gross profit as a percentage of net sales—OEM Laser Sources | | **48.7%** | | 53.6% | | (4.9)% | |
| Gross profit as a percentage of net sales—Industrial Lasers & Systems | | **18.3%** | | 28.6% | | (10.3)% | |
| Research and development as a percentage of net sales | | **7.9%** | | 6.9% | | 1.0 % | |
| Income from continuing operations before income taxes | **$** | **68,275** | $ | 191,974 | $ | (123,699) | (64.4)% |
| Net cash provided by operating activities | **$** | **126,323** | $ | 132,799 | $ | (6,476) | (4.9)% |
| Capital spending as a percentage of net sales | | **5.5%** | | 4.7% | | 0.8 % | |
| Net income from continuing operations as a percentage of net sales | | **7.4%** | | 11.2% | | (3.8)% | |
| Adjusted EBITDA as a percentage of net sales | | **20.7%** | | 29.9% | | (9.2)% | |

**Net Sales**

Net sales include sales of lasers, laser tools, related accessories and services. Net sales for the second quarter of fiscal 2019 decreased 27.0% in our OLS segment and decreased 13.9% in our ILS segment from the same quarter one year ago. Net sales for the first six months of fiscal 2019 decreased 26.3% in our OLS segment and decreased 10.7% in our ILS segment from the same period one year ago. For a description of the reasons for changes in net sales refer to the "Results of Operations" section of this quarterly report.

**Gross Profit as a Percentage of Net Sales**

Gross profit as a percentage of net sales ("gross profit percentage") is calculated as gross profit for the period divided by net sales for the period. Gross profit percentage in the second quarter of fiscal 2019 decreased to 46.6% from 53.2% in our OLS segment and decreased to 17.0% from 29.2% in our ILS segment from the same quarter one year ago. Gross profit percentage in the first six months of fiscal 2019 decreased to 48.7% from 53.6% in our OLS segment and decreased to 18.3% from 28.6% in our ILS segment from the same period one year ago. For a description of the reasons for changes in gross profit refer to the "Results of Operations" section of this quarterly report.

**Research and Development as a Percentage of Net Sales**

Research and development as a percentage of net sales ("R&D percentage") is calculated as research and development expense for the period divided by net sales for the period. Management considers R&D percentage to be an important indicator in managing our business as investing in new technologies is a key to future growth. R&D percentage increased to 8.2% for the second quarter of fiscal 2019 from 7.2% for the same quarter one year ago and increased to 7.9% for the first six months of fiscal 2019 from 6.9% for the same period one year ago. For a description of the reasons for changes in R&D spending refer to the "Results of Operations" section of this quarterly report.

**Net Cash Provided by Operating Activities**

Net cash provided by operating activities as reflected on our Condensed Consolidated Statements of Cash Flows primarily represents the excess of cash collected from billings to our customers and other receipts over cash paid to our vendors for expenses and inventory purchases to run our business. We believe that cash flows from operations is an important performance indicator because cash generation over the long term is essential to maintaining a healthy business and providing funds to help fuel growth. For a description of the reasons for changes in net cash provided by operating activities refer to the "Liquidity and Capital Resources" section of this quarterly report.

**Days Sales Outstanding in Receivables**

We calculate days sales outstanding ("DSO") in receivables as net receivables at the end of the period divided by net sales during the period and then multiplied by the number of days in the period, using 90 days for quarters. DSO in receivables indicates how well we are managing our collection of receivables, with lower DSO in receivables resulting in higher working capital availability. The more money we have tied up in receivables, the less money we have available for research and development, acquisitions, expansion, marketing and other activities to grow our business. Our DSO in receivables for the second quarter of fiscal 2019 increased to 75.6 days from 58.5 days compared to the same quarter one year ago. The increase was primarily due to slower collections of receivables for ELA tools used in the Asian flat panel display market and slower collections in Europe and the U.S. In addition, a higher concentration of sales of ELA tools shipped to Japan during the last two weeks of the quarter ended March 30, 2019 contributed to the increase in our DSO. These ELA tools are generally our highest priced products, so any delay in collection timing or concentration of sales at the end of a quarter will have a more significant impact on overall DSO than our other products.

**Annualized Second Quarter Inventory Turns**

We calculate annualized second quarter inventory turns as the cost of sales during the second quarter annualized and divided by net inventories at the end of the second quarter. This indicates how well we are managing our inventory levels, with higher inventory turns resulting in more working capital availability and a higher return on our investments in inventory. Our annualized inventory turns for the second quarter of fiscal 2019 decreased to 2.0 from 2.2 turns compared to the same quarter a year ago primarily as a result of a decrease in demand for sales of our large ELA tools partially offset by the favorable impact of foreign exchange rates.

**Capital Spending as a Percentage of Net Sales**

Capital spending as a percentage of net sales ("capital spending percentage") is calculated as capital expenditures for the period divided by net sales for the period. Capital spending percentage indicates the extent to which we are expanding or improving our operations, including investments in technology and equipment. Management monitors capital spending levels as this assists us in measuring our cash flows, net of capital expenditures. Our capital spending percentage increased to 4.9% for the second quarter of fiscal 2019 from 4.4% for the second quarter of fiscal 2018, and increased to 5.5% for the first six months of fiscal 2019 from 4.7% for the first six months of fiscal 2018 primarily due to the impact of lower revenues in the first two quarters of fiscal 2019 compared to the first two quarters of fiscal 2018 and lower investments to expand our manufacturing capacity in Germany and South Korea.

**Adjusted EBITDA as a Percentage of Net Sales**

We define adjusted EBITDA as operating income adjusted for depreciation, amortization, stock compensation expense, major restructuring costs and certain other non-operating income and expense items, such as costs related to our acquisitions. Key initiatives to reach our goals for EBITDA improvements include utilization of our Asian manufacturing locations, optimizing our supply chain and continued leveraging of our infrastructure.

We utilize a number of different financial measures, both GAAP and non-GAAP, such as adjusted EBITDA as a percentage of net sales, in analyzing and assessing our overall business performance, for making operating decisions and for forecasting and planning future periods. We consider the use of non-GAAP financial measures helpful in assessing our current financial performance and ongoing operations. While we use non-GAAP financial measures to enhance our understanding of certain aspects of our financial performance, we do not consider these measures to be a substitute for, or superior to, the information provided by GAAP financial measures. We provide adjusted EBITDA in order to enhance investors' understanding of our ongoing operations. This measure is used by some investors when assessing our performance.

Below is the reconciliation of our net income from continuing operations as a percentage of net sales to our adjusted EBITDA as a percentage of net sales:

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | **March 30, 2019** | **March 31, 2018** | **March 30, 2019** | **March 31, 2018** |
| Net income from continuing operations as a percentage of net sales | **5.6%** | 13.6% | **7.4%** | 11.2% |
| Income tax expense | **1.0%** | 5.4% | **1.6%** | 8.8% |
| Interest and other income (expense), net | **1.5%** | 2.1% | **1.7%** | 2.2% |
| Depreciation and amortization | **7.5%** | 5.9% | **7.5%** | 5.8% |
| Restructuring charges | **0.2%** | 0.1% | **0.2%** | 0.2% |
| Purchase accounting step-up | **—%** | 0.1% | **0.1%** | 0.1% |
| Costs related to acquisitions | **—%** | 0.1% | **—%** | —% |
| Stock-based compensation | **2.4%** | 1.7% | **2.2%** | 1.6% |
| Adjusted EBITDA as a percentage of net sales | **18.2%** | 29.0% | **20.7%** | 29.9% |

## SIGNIFICANT EVENTS

### Acquisitions

On October 5, 2018, we acquired privately held Ondax, Inc. ("Ondax") for approximately $12.0 million, excluding transaction costs. Ondax develops and produces photonic components which are used on an OEM basis by the laser industry as well as incorporated into its own stabilized lasers and Raman Spectroscopy systems. See Note 4, "Business Combinations" in the Notes to Condensed Consolidated Financial Statements.

On October 5, 2018, we acquired certain assets of Quantum Coating, Inc. ("Quantum") for approximately $7.0 million, excluding transaction costs. See Note 4, "Business Combinations" in the Notes to Condensed Consolidated Financial Statements.

### Stock repurchases

On October 28, 2018, our board of directors authorized a stock repurchase program authorizing the Company to repurchase up to $250.0 million of our common stock through December 31, 2019, with a limit of no more than $75.0 million per quarter. During the second quarter of fiscal 2019, we repurchased and retired 199,826 shares of outstanding common stock under this program at an average price of $129.64 per share for a total of $25.9 million. During the first six months of fiscal 2019, we repurchased and retired 394,627 shares of outstanding common stock under this program at an average price of $130.26 per share for a total of $51.4 million.

## RESULTS OF OPERATIONS

### CONSOLIDATED SUMMARY

The following table sets forth, for the periods indicated, the percentage of total net sales represented by the line items reflected in our condensed consolidated statements of operations:

| | Three Months Ended | | Six Months Ended | |
|---|---|---|---|---|
| | March 30, 2019 | March 31, 2018 | March 30, 2019 | March 31, 2018 |
| **Net sales** | **100.0 %** | 100.0 % | **100.0 %** | 100.0 % |
| **Cost of sales** | **64.9 %** | 55.2 % | **63.0 %** | 54.9 % |
| **Gross profit** | **35.1 %** | 44.8 % | **37.0 %** | 45.1 % |
| **Operating expenses:** | | | | |
| Research and development | **8.2 %** | 7.2 % | **7.9 %** | 6.9 % |
| Selling, general and administrative | **18.7 %** | 16.1 % | **17.7 %** | 15.7 % |
| Amortization of intangible assets | **0.5 %** | 0.6 % | **0.6 %** | 0.6 % |
| Total operating expenses | **27.4 %** | 23.9 % | **26.2 %** | 23.2 % |
| **Income from operations** | **7.7 %** | 20.9 % | **10.8 %** | 21.9 % |
| **Other income (expense), net** | **(1.1)%** | (2.0)% | **(1.8)%** | (1.9)% |
| **Income from continuing operations before income taxes** | **6.6 %** | 18.9 % | **9.0 %** | 20.0 % |
| Provision for income taxes | **1.0 %** | 5.3 % | **1.6 %** | 8.8 % |
| **Net income from continuing operations** | **5.6 %** | 13.6 % | **7.4 %** | 11.2 % |

Net income from continuing operations for the second quarter of fiscal 2019 was $20.8 million ($0.85 per diluted share). This included $10.0 million of after-tax amortization of intangible assets, $7.5 million of after-tax stock-based compensation expense, $0.8 million of after-tax restructuring costs and $0.1 million of excess tax charges for employee stock-based compensation. Net income from continuing operations for the second quarter of fiscal 2018 was $65.3 million ($2.61 per diluted share). This included $10.9 million of after-tax amortization of intangible assets, $7.2 million of after-tax stock-based compensation expense, $0.6 million of after-tax restructuring costs, $0.4 million of after-tax acquisition costs, $0.3 million of after-tax amortization of purchase accounting inventory and favorable lease step up, $0.3 million of excess tax benefits for employee stock-based compensation and a $0.1 million benefit for net other impairment charges (recoveries).

Net income from continuing operations for the first six months of fiscal 2019 was $56.3 million ($2.31 per diluted share). This included $20.8 million of after-tax amortization of intangible assets, $14.2 million of after-tax stock-based compensation expense, $1.1 million of after-tax restructuring costs, $0.4 million of after-tax amortization of purchase accounting inventory step up and $2.5 million of excess tax benefits for employee stock-based compensation. Net income from continuing operations for the first six months of fiscal 2018 was $107.2 million ($4.29 per diluted share). This included $21.7 million of after-tax amortization of intangible assets, $12.7 million of after-tax stock-based compensation expense, $1.4 million of after-tax restructuring costs, $0.4 million of after-tax acquisition costs, $0.3 million of after-tax amortization of purchase accounting inventory and favorable lease step up, a $0.2 million charge for net other impairment charges (recoveries), $41.7 million of largely one time additional income tax expense due to the provisions under the U.S. Tax Cuts and Jobs Act and $12.8 million of excess tax benefits for employee stock-based compensation.

## NET SALES

### Market Application

The following tables set forth, for the periods indicated, the amount of net sales and their relative percentages of total net sales by market application (dollars in thousands):

| | Three Months Ended | | | | |
|---|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | | |
| | Amount | Percentage of total net sales | | Amount | Percentage of total net sales |
| **Consolidated:** | | | | | |
| Microelectronics | **$ 169,265** | **45.4%** | $ | 261,308 | 54.3% |
| Materials processing | **104,922** | **28.1%** | | 135,822 | 28.2% |
| OEM components and instrumentation | **67,202** | **18.0%** | | 53,323 | 11.1% |
| Scientific and government programs | **31,471** | **8.5%** | | 30,665 | 6.4% |
| Total | **$ 372,860** | **100.0%** | $ | 481,118 | 100.0% |

| | Six Months Ended | | | | |
|---|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | | |
| | Amount | Percentage of total net sales | | Amount | Percentage of total net sales |
| **Consolidated:** | | | | | |
| Microelectronics | **$ 347,674** | **46.0%** | $ | 529,484 | 55.2% |
| Materials processing | **209,565** | **27.7%** | | 263,283 | 27.5% |
| OEM components and instrumentation | **133,555** | **17.7%** | | 102,179 | 10.7% |
| Scientific and government programs | **65,212** | **8.6%** | | 63,737 | 6.6% |
| Total | **$ 756,006** | **100.0%** | $ | 958,683 | 100.0% |

*Quarterly*

Net sales for the second quarter of fiscal 2019 decreased by $108.3 million, or 23%, compared to the second quarter of fiscal 2018, with significant decreases in the microelectronics and materials processing markets partially offset by increases in the OEM components and instrumentation and scientific and government programs markets. The acquisition of Ondax on October 5, 2018 added $1.6 million in incremental net sales to the materials processing market in the ILS segment in the second quarter of fiscal 2019. In the second quarter of fiscal 2019, we continued to experience softening in the microelectronics flat panel display market and in materials processing markets.

The decrease in the microelectronics market of $92.0 million, or 35%, was primarily due to lower shipments related to ELA tools used in the flat panel display market including lower revenues from consumable service parts. In microelectronics, although we expect some increase in service revenues in the second half of fiscal 2019, we expect that total flat panel display revenues, including both systems and services, will continue to decrease in the second half of fiscal 2019 as compared to the second half of fiscal 2018. In addition, we have experienced some customer push outs and order cancellations and may experience additional customer push outs over the next several quarters. We believe additional investment in OLED capacity for consumer products by our end customers will be required for a projected capital spending recovery to start in calendar 2020. In semiconductor applications within the microelectronics market, we expect semiconductor capital equipment spending to improve in the second half of fiscal 2019 as compared to the second half of fiscal 2018 as a result of stronger service revenues and increasing demand from internet connectivity (IoT) and automotive applications. We also expect second half fiscal 2019 demand in advanced packaging applications to be lower than second half fiscal 2018 levels.

Sales in the materials processing market decreased $30.9 million, or 23%, primarily due to decreased sales in marking, cutting and welding applications, primarily in China, other Asia-Pacific countries and Europe, and to a lesser extent in the United States. Chinese market conditions began to noticeably erode in the fourth quarter of fiscal 2018. Sales into the Chinese market were negatively impacted by tariffs on U.S. goods, macro trade discussions, increasing participation of Chinese manufacturers, and to a lesser extent stronger price competition for fiber laser products in certain end markets. This resulted in customers pushing out or cancelling orders in the fourth quarter of fiscal 2018 and the first quarter of fiscal 2019. While materials processing orders in the second quarter of fiscal 2019 improved in the low double digit range from the previous quarter, there are conflicting signs in the Chinese and European markets with respect to the possibility of a near-term rapid recovery. In China, trade issues with the U.S. and weak domestic demand persist. In Europe, its largest economy, Germany, recently published their PMI (Purchasing Managers Index) number at its lowest level since July of 2012. We expect these issues to continue to impact sales into the materials processing end market potentially resulting in a slow, steady recovery through the remainder of fiscal 2019.

The increase in the OEM components and instrumentation market of $13.9 million, or 26%, was due primarily to higher shipments for military, medical and bio-instrumentation applications. Within OEM components and instrumentation applications, we are seeing strong demand in the bio-instrumentation market, particularly in flow cytometry and sequencing applications and higher demand for consumables in the medical market in dental and urology applications. In addition, we are seeing strength in defense spending for U.S. directed-energy programs and in satellite optics.

Sales in the scientific and government programs market increased $0.8 million, or 3%, due to higher demand for advanced research applications used by university and government research groups, particularly in the United States. We expect demand in the scientific and government programs market to continue to fluctuate from quarter to quarter.

*Year-to-date*

Net sales for the first six months of fiscal 2019 decreased by $202.7 million, or 21%, compared to the first six months of fiscal 2018, with decreases in the microelectronics and materials processing markets partially offset by increases in the OEM components and instrumentation and scientific and government programs markets. The acquisitions of OR Laser on March 8, 2018 and Ondax on October 5, 2018 added $4.0 million and $2.9 million, respectively, in incremental net sales to the materials processing market in the ILS segment in the first six months of fiscal 2019.

The decrease in the microelectronics market of $181.8 million, or 34%, was primarily due to lower shipments related to ELA tools used in the flat panel display market including lower revenues from consumable service parts and was partially offset by a fee of $7.0 million related to the cancellation of orders from one customer for our ELA tools. Sales in the materials processing market decreased $53.7 million, or 20%, primarily due to decreased sales in marking, cutting and welding applications, primarily in China and Europe, and to a lesser extent in the United States. The increase in the OEM components and instrumentation market of $31.4 million, or 31%, was due primarily to higher shipments for military, medical and bio-instrumentation applications. Sales in the scientific and government programs market increased $1.5 million, or 2%, due to higher demand for advanced research applications used by university and government research groups in all regions.

**Segments**

We are organized into two reportable operating segments: OLS and ILS. While both segments deliver cost-effective, highly reliable photonics solutions, OLS is focused on high performance laser sources and complex optical sub-systems, typically used in microelectronics manufacturing, medical diagnostics and therapeutic medical applications, as well as in scientific research. ILS delivers high performance laser sources, sub-systems and tools primarily used for industrial laser materials processing, serving important end markets like automotive, machine tool, consumer goods and medical device manufacturing.

The following tables set forth, for the periods indicated, the amount of net sales and their relative percentages of total net sales by segment (dollars in thousands):

| | Three Months Ended | | | |
|---|---|---|---|---|
| | March 30, 2019 | | March 31, 2018 | |
| | Amount | Percentage of total net sales | Amount | Percentage of total net sales |
| **Consolidated:** | | | | |
| OEM Laser Sources (OLS) | **$ 231,597** | **62.1%** | $ 317,138 | 65.9% |
| Industrial Lasers & Systems (ILS) | **141,263** | **37.9%** | 163,980 | 34.1% |
| Total | **$ 372,860** | **100.0%** | $ 481,118 | 100.0% |

| | Six Months Ended | | | | | |
|---|---|---|---|---|---|---|
| | March 30, 2019 | | | March 31, 2018 | | |
| | | Amount | Percentage of total net sales | | Amount | Percentage of total net sales |
| **Consolidated:** | | | | | | |
| OEM Laser Sources (OLS) | $ | **473,945** | **62.7%** | $ | 642,795 | 67.0% |
| Industrial Lasers & Systems (ILS) | | **282,061** | **37.3%** | | 315,888 | 33.0% |
| Total | $ | **756,006** | **100.0%** | $ | 958,683 | 100.0% |

*Quarterly*

Net sales for the second quarter of fiscal 2019 decreased by $108.3 million, or 23%, compared to the second quarter of fiscal 2018, with decreases of $85.5 million, or 27%, in our OLS segment and $22.7 million, or 14%, in our ILS segment.

The decrease in our OLS segment sales was primarily due to lower shipments of ELA tools used in the flat panel display market and lower revenues from consumable service parts. The decrease in our ILS segment sales was primarily due to lower shipments for materials processing and microelectronics applications partially offset by higher shipments for military and medical applications within the OEM components and instrumentation market.

*Year-to-date*

Net sales for the first six months of fiscal 2019 decreased by $202.7 million, or 21%, compared to the first six months of fiscal 2018, with decreases of $168.9 million, or 26%, in our OLS segment and $33.8 million, or 11%, in our ILS segment.

The decrease in our OLS segment sales was primarily due to lower shipments of ELA tools used in the flat panel display market and lower revenues from consumable service parts. The decrease in our ILS segment sales was primarily due to lower shipments for materials processing and microelectronics applications partially offset by higher shipments for military and medical applications within the OEM components and instrumentation market.

**GROSS PROFIT**

**Consolidated**

Our gross profit percentage decreased by 9.7% to 35.1% in the second quarter of fiscal 2019 from 44.8% in the second quarter of fiscal 2018 and decreased by 8.1% to 37.0% in the first six months of fiscal 2019 from 45.1% in the first six months of fiscal 2018.

The 9.7% decrease in gross profit percentage during the second quarter was primarily due to unfavorable product margins (5.6%), higher other costs (2.1%), higher warranty costs (1.2%), higher intangibles amortization (0.7%) and higher stock-based compensation (0.1%) as a percentage of sales. The unfavorable product margins were in both segments and were due to the impact from the unfavorable absorption of manufacturing costs on lower volumes and unfavorable mix from lower shipments of higher margin ELA tools and consumable parts used in the flat panel display market as well as lower average selling prices for our high power fiber lasers, partially offset by the favorable impact on costs due to the weaker Euro. Other costs were higher primarily due to higher inventory provisions for excess and obsolete inventory and higher duty expenses in certain business units as a percentage of sales including the impact of lower sales volumes. The higher warranty costs, primarily in our ILS segment, included higher warranty events with the largest impact for fiber lasers, primarily sold into China. Intangibles amortization expense as a percentage of sales was higher in the second quarter of fiscal 2019 due to amortization related to the acquisitions of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019 as well as the impact of lower sales, partially offset by the favorable impact of foreign exchange rates.

The 8.1% decrease in the gross profit percentage during the first six months of fiscal 2019 was primarily due to unfavorable product margins (3.8%), higher other costs (2.1%), higher warranty costs (1.5%), higher intangibles amortization (0.6%) and higher stock-based compensation (0.1%) as a percentage of sales. The unfavorable product margins were in both segments and were primarily due to the impact from the unfavorable absorption of manufacturing costs on lower volumes and unfavorable mix from lower shipments of higher margin ELA tools and consumable parts used in the flat panel display market, partially offset by the favorable impact (0.6%) of a fee of $7.0 million related to the cancellation of orders from one customer for our ELA tools. Product costs were also impacted by the unfavorable mix in shipments for several applications in our ILS segment, partially offset by the favorable impact on costs due to the weaker Euro. Other costs were higher primarily due to higher inventory provisions for excess and obsolete inventory and higher duty expenses in certain business units as a percentage of sales including the impact of lower sales volumes. The higher warranty costs, primarily in our ILS segment, included higher warranty events with the largest impact for fiber lasers, primarily sold into China. Intangibles amortization expense as a percentage of sales was higher in the first six months of fiscal 2019 due to amortization related to the acquisitions of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019 as well as the impact of lower sales, partially offset by the favorable impact of foreign exchange rates and the completion of amortization of intangibles from certain acquisitions in fiscal 2018.

Our gross profit percentage has been and will continue to be affected by a variety of factors including market and product mix, pricing on volume orders, shipment volumes, our ability to manufacture advanced and more complex products, manufacturing efficiencies, excess and obsolete inventory write-downs, warranty costs, amortization of intangibles, pricing by competitors or suppliers, new product introductions, production volume, customization and reconfiguration of systems, commodity prices and foreign currency fluctuations, particularly the recent volatility of the Euro and to a lesser extent, the Japanese Yen and South Korean Won.

**OEM Laser Sources**

The gross profit percentage in our OLS segment decreased by 6.6% to 46.6% in the second quarter of fiscal 2019 from 53.2% in the second quarter of fiscal 2018. The gross profit percentage in our OLS segment decreased by 4.9% to 48.7% in the first six months of fiscal 2019 from 53.6% in the same period one year ago.

The 6.6% second quarter decrease in gross profit percentage was primarily due to unfavorable product margins (4.4%) as a result of unfavorable absorption of manufacturing costs on lower volumes and the unfavorable impact of lower shipments of ELA tools and consumable parts used in the flat panel display market partially offset by the favorable impact of the weaker Euro. In addition, higher other costs (2.3%) due to higher inventory provisions for excess and obsolete inventory in certain business units and higher freight and duty costs as a percentage of sales contributed to the decline. The gross profit percentage was further unfavorably impacted by higher intangibles amortization (0.1%) due to the impact of lower sales, partially offset by the favorable impact of foreign exchange rates. Partially offsetting the decrease in gross profit percentage was the favorable impact of lower warranty costs (0.2%) as a percentage of sales due to fewer warranty events in the microelectronics market net of the unfavorable impact of lower sales.

The 4.9% decrease in the gross profit percentage during the first six months of fiscal 2019 was primarily due to unfavorable product margins (2.9%) as a result of unfavorable absorption of manufacturing costs on lower volumes and lower margins within flat panel display systems as well as higher other costs (2.1%) due to higher inventory provisions for excess and obsolete inventory in certain business units and higher freight and duty costs as a percentage of sales. The lower margins within the flat panel display systems market included the unfavorable impact of lower shipments of ELA tools and consumable parts partially offset by the favorable impact of a fee of $7.0 million related to the cancellation of orders from one customer for our ELA tools (0.8%) and the favorable impact of the weaker Euro. Partially offsetting the decrease in gross profit percentage was the favorable impact of lower intangibles amortization (0.1%) as a percentage of sales due to the completion of amortization of intangibles from certain acquisitions in fiscal 2018 and the favorable impact of foreign exchange rates partially offset by the impact of lower sales.

**Industrial Lasers & Systems**

The gross profit percentage in our ILS segment decreased by 12.2% to 17.0% in the second quarter of fiscal 2019 from 29.2% in the second quarter of fiscal 2018. The gross profit percentage in our ILS segment decreased by 10.3% to 18.3% in the first six months of fiscal 2019 from 28.6% in the same period one year ago.

The 12.2% decrease in gross profit percentage compared to the second quarter of fiscal 2018 was primarily due to unfavorable product costs including unfavorable absorption of manufacturing costs on lower volumes (6.3%) over multiple products, higher warranty costs (3.3%) due to higher warranty events particularly for our fiber laser products sold in China and higher other costs (1.7%). Other costs were unfavorable due to higher shipping and duty charges as a percentage of sales, including the impact of lower sales volumes. In addition, the gross profit percentage in the second quarter of fiscal 2019 included an unfavorable impact of higher amortization of intangibles (0.9%) as a percentage of sales due to our acquisition of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019 as well as the impact of lower sales partially offset by the favorable impact of foreign exchange rates.

The 10.3% decrease in gross profit percentage during the first six months of fiscal 2019 was primarily due to higher warranty costs (4.1%) due to higher warranty events particularly for our fiber laser and global tools products sold in China, unfavorable product costs including unfavorable absorption of manufacturing costs on lower volumes (3.4%) over multiple products and higher other costs (1.9%). Other costs were unfavorable due to higher shipping and duty charges and higher inventory provisions for excess and obsolete inventory as a percentage of sales, including the impact of lower sales volumes. In addition, the gross profit percentage in the first six months of fiscal 2019 included an unfavorable impact of higher amortization of intangibles (0.9%) as a percentage of sales due to our acquisition of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019 as well as the impact of lower sales, partially offset by the favorable impact of foreign exchange rates.

**OPERATING EXPENSES:**

| | Three Months Ended | | | |
|---|---|---|---|---|
| | **March 30, 2019** | | **March 31, 2018** | |
| | **Amount** | **Percentage of total net sales** | **Amount** | **Percentage of total net sales** |
| | **(Dollars in thousands)** | | | |
| Research and development | **$ 30,461** | **8.2%** | $ 34,783 | 7.2% |
| Selling, general and administrative | **69,463** | **18.7%** | 77,146 | 16.1% |
| Impairment and other charges (recoveries) | **—** | **—%** | (110) | —% |
| Amortization of intangible assets | **1,926** | **0.5%** | 2,950 | 0.6% |
| Total operating expenses | **$ 101,850** | **27.4%** | $ 114,769 | 23.9% |

| | Six Months Ended | | | |
|---|---|---|---|---|
| | **March 30, 2019** | | **March 31, 2018** | |
| | **Amount** | **Percentage of total net sales** | **Amount** | **Percentage of total net sales** |
| | **(Dollars in thousands)** | | | |
| Research and development | **$ 59,403** | **7.9%** | $ 66,175 | 6.9% |
| Selling, general and administrative | **134,020** | **17.7%** | 150,583 | 15.7% |
| Impairment and other charges (recoveries) | **—** | **—%** | 155 | —% |
| Amortization of intangible assets | **4,966** | **0.6%** | 5,556 | 0.6% |
| Total operating expenses | **$ 198,389** | **26.2%** | $ 222,469 | 23.2% |

**Research and development**

*Quarterly*

Research and development ("R&D") expenses decreased $4.3 million, or 12%, during the second quarter of fiscal 2019 compared to the same quarter one year ago. The decrease was primarily due to $4.7 million lower spending on R&D activities, with lower spending on headcount including lower variable compensation, lower spending on materials and the favorable impact of foreign exchange rates (primarily the weaker Euro). R&D expenses also decreased $0.1 million as a result of lower stock-based compensation. Offsetting the decreases, R&D expenses increased $0.5 million in incremental spending due to the acquisition of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019.

On a segment basis as compared to the prior year period, OLS spending decreased $1.2 million primarily due to lower net spending on R&D activities including the favorable impact of foreign exchange rates. ILS spending decreased $1.6 million primarily due to lower net spending on R&D activities and the favorable impact of foreign exchange rates partially offset by the acquisitions of OR Laser and Ondax. Corporate and other spending decreased $1.5 million primarily due to lower headcount spending in our Advanced Research Business unit and lower stock-based compensation.

*Year-to-date*

R&D expenses decreased $6.8 million, or 10%, during the first six months of fiscal 2019 compared to the same period one year ago. The decrease was primarily due to $7.1 million lower spending on R&D activities, with lower spending on headcount including lower variable compensation and higher savings from company holiday shutdowns (two holiday shutdown periods in fiscal 2019 versus one in fiscal 2018), lower spending on materials and the favorable impact of foreign exchange rates (primarily the weaker Euro). R&D expenses also decreased $0.6 million as a result of lower charges for increases in deferred compensation plan liabilities and by $0.2 million as a result of lower stock-based compensation. Offsetting the decreases, R&D expenses increased $1.1 million in incremental spending due to the acquisition of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019.

On a segment basis as compared to the prior year period, OLS spending decreased $1.9 million primarily due to lower net spending on R&D activities including the favorable impact of foreign exchange rates. ILS spending decreased $2.2 million primarily due to lower net spending on R&D activities and the favorable impact of foreign exchange rates partially offset by the acquisitions of OR Laser and Ondax. Corporate and other spending decreased $2.7 million primarily due to lower headcount spending in our Advanced Research Business unit, lower charges for increases in deferred compensation plan liabilities and lower stock-based compensation.

**Selling, general and administrative**

*Quarterly*

Selling, general and administrative ("SG&A") expenses decreased $7.7 million, or 10%, during the second quarter of fiscal 2019 compared to the same quarter one year ago. The decrease was primarily due to $6.6 million lower spending on headcount due to lower variable compensation, higher savings from company holiday shutdowns and the favorable impact of foreign exchange rates and $3.0 million lower variable spending. The lower variable spending includes the favorable impact of foreign exchange rates as well as lower spending on legal, consulting and infrastructure related to integration activities, acquisitions and compliance with the terms of the Credit Agreement partially offset by higher bad debt expense for specific customers. The decreases were offset by $0.8 million higher incremental spending due to the acquisition of Ondax in the first quarter of fiscal 2019 and OR Laser in the second quarter of fiscal 2018, $0.6 million higher charges for increases in deferred compensation plan liabilities and $0.5 million higher stock-based compensation expense.

On a segment basis as compared to the prior year period, OLS expenses decreased $5.1 million primarily due to lower spending on variable compensation, lower variable spending and the favorable impact of foreign exchange rates. ILS spending decreased $2.7 million primarily due to the favorable impact of foreign exchange rates, lower spending on benefits and salaries and lower variable compensation partially offset by the acquisitions of Ondax and OR Laser. Corporate and other spending increased $0.1 million primarily due to higher charges for the deferred compensation plan and higher stock-based compensation expense offset by lower spending on legal, consulting and infrastructure related to integration activities and compliance with the terms of the Credit Agreement and lower legal and consulting costs associated with acquisitions.

*Year-to-date*

SG&A expenses decreased $16.6 million, or 11%, during the first six months of fiscal 2019 compared to the same period one year ago. The decrease was primarily due to $13.0 million lower spending on headcount due to lower variable compensation, higher savings from company holiday shutdowns and the favorable impact of foreign exchange rates, $4.2 million lower variable spending and $2.8 million lower charges for increases in deferred compensation plan liabilities. The lower variable spending includes the favorable impact of foreign exchange rates as well as lower spending on legal, consulting and infrastructure related to integration activities, acquisitions and compliance with the terms of the Credit Agreement partially offset by higher bad debt expense for specific customers, primarily in Europe. The decreases were offset by $2.3 million higher incremental spending due to the acquisition of OR Laser in the second quarter of fiscal 2018 and Ondax in the first quarter of fiscal 2019 and $1.1 million higher stock-based compensation expense.

On a segment basis as compared to the prior year period, OLS expenses decreased $8.9 million primarily due to lower spending on variable compensation, lower other variable spending and the favorable impact of foreign exchange rates. ILS spending decreased $1.8 million primarily due to lower variable compensation, lower spending on benefits and salaries, the favorable impact of foreign exchange rates and lower other variable spending partially offset by the acquisitions of OR Laser and Ondax. Corporate and other spending decreased $5.9 million primarily due to lower charges for the deferred compensation plan, lower variable compensation, and lower spending on legal, consulting and infrastructure related to integration activities, acquisitions and compliance with the terms of the Credit Agreement, all of which was partially offset by higher stock-based compensation expense.

**Impairment and other charges**

In the fourth quarter of fiscal 2017, management decided to sell several entities that we acquired in the Rofin acquisition. Although the sale of the entities was not completed until the third quarter of fiscal 2018, we recorded non-cash impairment charges (recoveries) of $0.3 million and ($0.5 million) to operating expense in our results of operations in the first and second quarters of fiscal 2018. See Note 20, "Discontinued Operations and Sale of Assets Held for Sale" in the Notes to Condensed Consolidated Financial Statements. In the second quarter of fiscal 2018, we also recorded a $0.4 million impairment charge to reduce the carrying value of a building to its fair value.

**Amortization of intangible assets**

Amortization of intangible assets decreased $1.0 million and $0.6 million, respectively, in the three and six months ended March 30, 2019 compared to the same periods last year. The decreases were primarily due to the favorable impact of foreign exchange rates and the completion of the amortization of certain intangibles from acquisitions partially offset by the amortization of intangibles related to our acquisitions of Ondax and Quantum assets in the first quarter of fiscal 2019.

**OTHER INCOME (EXPENSE) — NET**

Other income (expense), net, changed by $5.3 million to an expense of $4.3 million in the second quarter of fiscal 2019 from an expense of $9.5 million in the second quarter of fiscal 2018. Other income (expense), net, changed by $4.6 million to an expense of $13.4 million in the first six months of fiscal 2019 from an expense of $18.0 million in the first six months of fiscal 2018.

The second fiscal quarter decrease in net other expense was primarily due to $2.8 million lower interest expense, $0.9 million higher benefit from the non-service portion of periodic pension costs, $0.8 million lower foreign exchange losses and $0.5 million higher gains, net of expenses, on our deferred compensation plan assets. Interest expense decreased primarily due to lower amortization of bond issue costs related to the Euro Term Loan and lower interest on the Euro Term Loan due to fiscal 2018 payments of principal and an interest rate reduction partially offset by higher interest expense on line of credit borrowings made in the first quarter of fiscal 2019.

The decrease for the first six months of fiscal 2019 in net other expense was primarily due to $6.7 million lower interest expense, $0.9 million higher benefit from the non-service portion of periodic pension costs and $0.9 million lower foreign exchange losses partially offset by $3.5 million lower gains/higher losses, net of expenses, on our deferred compensation plan assets and $0.3 million lower interest income. Interest expense decreased primarily due to lower amortization of bond issue costs related to the Euro Term Loan and lower interest on the Euro Term Loan due to fiscal 2018 payments of principal and an interest rate reduction partially offset by higher interest expense on line of credit borrowings made in the first quarter of fiscal 2019.

**INCOME TAXES**

Our effective tax rates on income from continuing operations before income taxes for the three and six months ended March 30, 2019 were 15.7% and 17.5%, respectively. Our effective tax rates for the three and six months ended March 30, 2019 were lower than the U.S. federal tax rate of 21.0% primarily due to the excess tax benefits from restricted stock unit vesting, the benefit of federal research and development tax credits and our Singapore and South Korea tax exemptions. These amounts are partially offset by the impact of income subject to foreign tax rates that are higher than the U.S. tax rates, an accrual for foreign withholding taxes on certain current year foreign earnings not considered permanently reinvested, stock-based compensation not deductible for tax purposes and limitations on the deductibility of compensation under IRC Section 162(m).

Our effective tax rate on income from continuing operations before income taxes for the three and six months ended March 31, 2018 were 28.4% and 44.2%, respectively. Our effective tax rate for the three months ended March 31, 2018 was higher than the effective U.S. federal blended tax rate of 24.5% primarily due to the impact of income subject to foreign tax rates that are higher than the U.S. tax rates. This amount is partially offset by the benefit of foreign tax credits, the benefit of federal research and development tax credits, the benefit of a domestic manufacturing deduction under IRC Section 199 and the Singapore tax exemption. Our effective tax rate for the six months ended March 31, 2018 was higher than the effective U.S. federal blended tax rate of 24.5% primarily due to the Tax Act's one-time mandatory deemed repatriation transition tax, the impact of income subject to foreign tax rates that are higher than the U.S. tax rates, the remeasurement of deferred tax assets and liabilities based on the newly enacted U.S. federal tax rate of 21.0%, stock-based compensation not deductible for tax purposes and limitations on the deductibility of compensation under IRC Section 162(m). These amounts are partially offset by the excess tax benefits from stock award exercises and restricted stock unit vesting, the benefit of foreign tax credits, the benefit of federal research and development tax credits, the benefit of a domestic manufacturing deduction under IRC Section 199 and the Singapore tax exemption.

**LIQUIDITY AND CAPITAL RESOURCES**

At March 30, 2019, we had assets classified as cash and cash equivalents and short-term investments, in an aggregate amount of $348.8 million, compared to $310.6 million at September 29, 2018. In addition, at March 30, 2019, we had $13.2 million of restricted cash. At March 30, 2019, approximately $280.4 million of our cash and securities was held in certain of our foreign subsidiaries and branches, $262.0 million of which was denominated in currencies other than the U.S. dollar. At March 30, 2019, we had approximately $279.6 million of cash held by foreign subsidiaries including certain entities where we intend to permanently reinvest our accumulated earnings and our current plans do not demonstrate a need for these funds to support our domestic operations. If, however, a portion of these funds are needed for and distributed to our operations in the United States, we may be subject to additional foreign withholding taxes and certain state taxes. The amount of the U.S. and foreign taxes due would depend on the amount and manner of repatriation, as well as the location from where the funds are repatriated. We historically asserted our intention to indefinitely reinvest foreign earnings. However, we have reevaluated our historic assertion as a result of the enactment of the Tax Act and no longer consider certain historic and current foreign earnings to be indefinitely reinvested in our foreign subsidiaries. We actively monitor the third-party depository institutions that hold these assets, primarily focusing on the safety of principal and secondarily maximizing yield on these assets. We diversify our cash and cash equivalents and investments among various financial institutions, money market funds, sovereign debt and other securities in order to reduce our exposure should any one of these financial institutions or financial instruments fail or encounter difficulties. To date, we have not experienced any material loss or lack of access to our invested cash, cash equivalents or short-term investments. However, we can provide no assurances that access to our invested cash, cash equivalents or short-term investments will not be impacted by adverse conditions in the financial markets.

See "Part I, Item 3. Quantitative and Qualitative Disclosures About Market Risk" below for more information about risks and trends related to foreign currencies.

**Sources and Uses of Cash**

Historically, our primary source of cash has been provided by operations. Other sources of cash in the past three fiscal years include proceeds from our Euro Term Loan used to finance our acquisition of Rofin, proceeds received from the sale of our stock through our employee stock purchase plan as well as borrowings under our Revolving Credit Facility and our domestic line of credit. Our historical uses of cash have primarily been for acquisitions of businesses and technologies, the repurchase of our common stock, capital expenditures and debt issuance costs. Supplemental information pertaining to our historical sources and uses of cash is presented as follows and should be read in conjunction with our condensed consolidated statements of cash flows and the notes to condensed consolidated financial statements:

| | Six Months Ended | |
|---|---|---|
| | **March 30, 2019** | **March 31, 2018** |
| | **(in thousands)** | |
| Net cash provided by operating activities | **$ 126,323** | $ 132,799 |
| Acquisition of businesses, net of cash acquired | **(18,881)** | (45,448) |
| Investment in 3D-Micromac AG | **(3,423)** | — |
| Issuance of shares under employee stock plans | **5,704** | 4,899 |
| Net settlement of restricted common stock | **(15,141)** | (36,250) |
| Repurchase of common stock | **(51,406)** | — |
| Borrowings, net of repayments | **36,387** | (167,196) |
| Purchases of property and equipment | **(41,525)** | (44,951) |
| Proceeds from sale of discontinued operation (the Hull Business) | **—** | 25,000 |

Net cash provided by operating activities decreased by $6.5 million for the first six months of fiscal 2019 compared to the same period one year ago. The decrease in cash provided by operating activities was primarily due to lower cash flows from income taxes payable and deferred taxes, lower net income and lower accounts payable, which were partially offset by higher cash flows from inventories, accounts receivable and deferred revenue. We believe that our existing cash, cash equivalents and short term investments combined with cash to be provided by operating activities and amounts available under our revolving credit facility will be adequate to cover our working capital needs and planned capital expenditures for at least the next 12 months to the extent such items are known or are reasonably determinable based on current business and market conditions. However, we may elect to finance certain of our capital expenditure requirements through other sources of capital. We continue to follow our strategy to further strengthen our financial position by using available cash flow to fund operations.

We intend to continue to consider acquisition opportunities at valuations we believe are reasonable based upon market conditions. However, we cannot accurately predict the timing, size and success of our acquisition efforts or our associated potential capital commitments. Furthermore, we cannot assure you that we will be able to acquire businesses on terms acceptable to us. We expect to fund future acquisitions, if any, through additional borrowings (as in our acquisition of Rofin), existing cash balances and cash flows from operations (as in our acquisitions of OR Laser, Ondax and certain Quantum assets). If required, we will consider the issuance of securities. The extent to which we will be willing or able to use our common stock to make acquisitions will depend on its market value at the time and the willingness of potential sellers to accept it as full or partial payment.

In fiscal 2018, we made debt principal payments of $170.1 million, including voluntary prepayments of $162.1 million, recorded interest expense on the Euro Term Loan of $14.9 million and recorded $9.6 million amortization of debt issuance costs.

In the first six months of fiscal 2019, we made debt principal payments of $3.8 million, recorded interest expense on the Euro Term Loan of $5.9 million and recorded $2.6 million amortization of debt issuance costs. On November 20, 2018, we borrowed an additional $40.0 million under the Revolving Credit Facility and recorded interest expense of $0.9 million in the first six months of fiscal 2019.

On October 5, 2018, we acquired privately held Ondax for approximately $12.0 million, excluding transaction costs. On October 5, 2018, we acquired certain assets of Quantum Coating, Inc. for approximately $7.0 million, excluding transaction costs. On March 8, 2018, we acquired privately held OR Laser for approximately $47.4 million, excluding transaction costs.

On April 27, 2018, we completed the sale of several entities that we acquired in the Rofin acquisition for approximately $6.3 million. On October 11, 2017, we completed the sale of the Hull Business for approximately $25.0 million.

On February 6, 2018, our board of directors authorized a buyback program authorizing the Company to repurchase up to $100.0 million of our common stock from time to time through January 31, 2019. During fiscal 2018, we repurchased and retired 574,946 shares of outstanding common stock at an average price of $173.91 per share for a total of $100.0 million. See Note 13, "Stock Repurchases" in the Notes to Condensed Consolidated Financial Statements.

On October 28, 2018, our board of directors authorized a stock repurchase program authorizing the Company to repurchase up to $250.0 million of our common stock through December 31, 2019, with a limit of no more than $75.0 million per quarter. During the first six months of fiscal 2019, we repurchased and retired 394,627 shares of outstanding common stock under this program at an average price of $130.26 per share for a total of $51.4 million. See Note 13, "Stock Repurchases" in the Notes to Condensed Consolidated Financial Statements.

Additional sources of cash available to us, in addition to the amounts available under the Revolving Credit Facility, were international currency lines of credit and bank credit facilities totaling $26.2 million as of March 30, 2019, of which $17.1 million was unused and available. These unsecured international credit facilities were used in Europe and Japan during the first six months of fiscal 2019. As of March 30, 2019, we had utilized $7.8 million of the international credit facilities as guarantees in Europe and $1.3 million as borrowings in Japan.

Our ratio of current assets to current liabilities increased to 3.4:1 at March 30, 2019 compared to 3.3:1 September 29, 2018. The increase in our ratio was due to lower income taxes payable, lower other current liabilities and higher cash and cash equivalents and short-term investments, offset by decreases in our ratio due to short-term borrowings against our line of credit and lower accounts receivable. Our cash and cash equivalents, short-term investments and working capital are as follows:

| | March 30, 2019 | September 29, 2018 |
|---|---|---|
| | (in thousands) | |
| Cash and cash equivalents | **$ 337,321** | $ 310,495 |
| Short-term investments | **11,480** | 120 |
| Working capital | **861,274** | 865,664 |

**Contractual Obligations and Off-Balance Sheet Arrangements**

We have no off-balance sheet arrangements as defined under Regulation S-K of the Securities Act of 1933. Information regarding our operating lease payments, asset retirement obligations, long-term debt payments, pension obligations, purchase commitments with suppliers and purchase obligations is provided in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" of our Annual Report on Form 10-K for the fiscal year ended September 29, 2018. There have been no material changes in contractual obligations outside of the ordinary course of business since September 29, 2018. Information regarding our other financial commitments at March 30, 2019 is provided in the Notes to Condensed Consolidated Financial Statements in this report.

**Changes in Financial Condition**

Cash provided by operating activities during the first six months of fiscal 2019 was $126.3 million, which included net income of $56.3 million, depreciation and amortization of $59.4 million and stock-based compensation expense of $16.9 million partially offset by cash used by operating assets and liabilities of $0.9 million (primarily lower income taxes payable, deferred income, customer deposits and accrued payroll net of lower accounts receivable) and net increases in deferred tax assets of $4.5 million. Cash provided by operating activities during the first six months of fiscal 2018 was $132.8 million, which included net income of $107.2 million, depreciation and amortization of $63.0 million, stock-based compensation expense of $15.5 million and net decreases in deferred tax assets of $14.1 million partially offset by cash used by operating assets and liabilities of $67.5 million (primarily increases in inventories and decreases in deferred income net of higher income taxes payable and higher accounts payable).

Cash used in investing activities during the first six months of fiscal 2019 was $70.8 million, which included $37.2 million, net of proceeds from dispositions, used to acquire property and equipment and purchase and upgrade buildings, $18.9 million, net of cash acquired, to purchase Ondax and Quantum, $11.3 million net purchases of available-for-sale securities and $3.4 million invested in 3D-Micromac AG. Cash used in investing activities during the first six months of fiscal 2018 was $69.5 million, which included $44.8 million, net of proceeds from dispositions, used to acquire property and equipment and purchase and upgrade buildings, $45.4 million, net of cash acquired, to purchase OR Laser and $4.6 million net purchases of available-for-sale securities partially offset by $25.0 million proceeds from the sale of discontinued operations.

Cash used in financing activities during the first six months of fiscal 2019 was $24.5 million, which included $51.4 million used to repurchase shares of our common stock and $15.1 million in outflows due to net settlement of restricted stock units partially offset by $36.4 million net debt borrowings and $5.7 million generated from our employee stock option and purchase plans. Cash used in financing activities during the first six months of fiscal 2018 was $198.5 million, which included $167.2 million net debt payments and $36.2 million in outflows due to net settlement of restricted stock units partially offset by $4.9 million generated from our employee stock option and purchase plans.

Changes in exchange rates during the first six months of fiscal 2019 resulted in a decrease in cash balances of $4.6 million. Changes in exchange rates during the first six months of fiscal 2018 resulted in an increase in cash balances of $1.7 million.

**RECENT ACCOUNTING STANDARDS**

See Note 2, "Recent Accounting Standards" in the Notes to Condensed Consolidated Financial Statements for a full description of recent accounting pronouncements, including the respective dates of adoption or expected adoption and effects on our condensed consolidated financial position, results of operations and cash flows.

## ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

### Market risk disclosures

We are exposed to market risk related to changes in interest rates and foreign currency exchange rates. We do not use derivative financial instruments for speculative or trading purposes.

### Interest rate sensitivity

A portion of our investment portfolio is composed of fixed income securities. These securities are subject to interest rate risk and will fall in value if market interest rates increase. If market interest rates were to increase immediately (whether due to changes in overall market rates or credit worthiness of the issuers of our individual securities) and uniformly by 10% from levels at March 30, 2019, the fair value of the portfolio, based on quoted market prices in active markets involving similar assets, would decline by an immaterial amount due to their short-term maturities. We have the ability to generally hold our fixed income investments until maturity and therefore we would not expect our operating results or cash flows to be affected to any significant degree by the effect of a sudden change in market interest rates on our securities portfolio. If necessary, we may sell short-term investments prior to maturity to meet our liquidity needs.

At March 30, 2019, the fair value of our available-for-sale debt securities was $15.6 million, $4.1 million of which was classified as cash and cash equivalents and $11.5 million of which was classified as short-term investments.

We are exposed to market risks related to fluctuations in interest rates related to our Euro Term Loan. As of March 30, 2019, we owed $413.7 million on this loan with an interest rate of 2.75%. We performed a sensitivity analysis on the outstanding portion of our debt obligation as of March 30, 2019. Should the current average interest rate increase or decrease by 10%, the resulting annual increase or decrease to interest expense would be approximately $1.1 million as of March 30, 2019.

### Foreign currency exchange risk

We maintain operations in various countries outside of the United States and have foreign subsidiaries that manufacture and sell our products in various global markets. The majority of our sales are transacted in U.S. dollars. However, we do generate revenues in other currencies, primarily the Euro, the Japanese Yen, the South Korean Won and the Chinese Renminbi. Additionally we have operations in different countries around the world with costs incurred in the foregoing currencies and other local currencies, such as British Pound Sterling, Singapore Dollar, Malaysian Ringgit, Swiss Franc, Taiwan Dollar, Swedish Krona and Canadian Dollar. As a result, our earnings, cash flows and cash balances are exposed to fluctuations in foreign currency exchange rates. For example, because of our significant manufacturing operations in Europe, a weakening Euro is advantageous and a strengthening Euro is disadvantageous to our financial results. We attempt to limit these exposures through financial market instruments. We utilize derivative instruments, primarily forward contracts with maturities of two months or less, to manage our exposure associated with anticipated cash flows and net asset and liability positions denominated in foreign currencies. Gains and losses on the forward contracts are mitigated by gains and losses on the underlying instruments. We do not use derivative financial instruments for trading purposes.

We do not anticipate any material adverse effect on our condensed consolidated financial position, results of operations or cash flows resulting from the use of these instruments. There can be no assurance that these strategies will be effective or that transaction losses can be minimized or forecasted accurately. While we model currency valuations and fluctuations, these may not ultimately be accurate. If a financial counterparty to any of our hedging arrangements experiences financial difficulties or is otherwise unable to honor the terms of the foreign currency hedge, we may experience material financial losses. In the current economic environment, the risk of failure of a financial party remains high.

At March 30, 2019, approximately $280.4 million of our cash, cash equivalents and short-term investments were held outside the U.S. in certain of our foreign operations, $262.0 million of which was denominated in currencies other than the U.S. dollar.

A hypothetical 10% change in foreign currency rates on our forward contracts would not have a material impact on our results of operations, cash flows or financial position.

The following table provides information about our foreign exchange forward contracts at March 30, 2019. The table presents the weighted average contractual foreign currency exchange rates, the value of the contracts in U.S. dollars at the contract exchange rate as of the contract maturity date and fair value. The U.S. fair value represents the fair value of the contracts valued at March 30, 2019 rates.

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Forward contracts to sell (buy) foreign currencies for U.S. dollars (in thousands, except contract rates):

| | Average Contract Rate | U.S. Notional Contract Value | U.S. Fair Value |
|---|---|---|---|
| Non-Designated - For U.S. Dollars | | | |
| Euro | 1.1410 | $ (37,276) | $ (551) |
| Japanese Yen | 110.4891 | $ 11,848 | $ 21 |
| British Pound | 1.3268 | $ 3,805 | $ 50 |
| South Korean Won | 1,114.8645 | $ 29,048 | $ 514 |
| Chinese Renminbi | 6.6929 | $ 24,455 | $ 66 |
| Singapore Dollar | 1.3488 | $ (31,902) | $ (126) |
| Malaysian Ringgit | 4.0646 | $ 1,590 | $ 7 |
| Canadian Dollar | 1.3201 | $ (573) | $ (6) |
| Swiss Franc | 0.9963 | $ (3,077) | $ 6 |
| Swedish Krona | 9.2874 | $ (2,023) | $ 8 |

## ITEM 4. CONTROLS AND PROCEDURES

### Management's Evaluation of Disclosure Controls and Procedures

We have evaluated the effectiveness of the design and operation of our disclosure controls and procedures, as such term is defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as of March 30, 2019 ("Evaluation Date"). The controls evaluation was conducted under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded as of the Evaluation Date that our disclosure controls and procedures were effective in providing reasonable assurance that information required to be disclosed by us in reports that we file or submit under the Securities Exchange Act of 1934, as amended, is (i) recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (ii) accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosures.

### Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting during the three months ended March 30, 2019.

### Inherent Limitations over Internal Control

Internal control over financial reporting is a process designed 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 ("GAAP"). Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP. Our internal control over financial reporting includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on the financial statements.

Management, including our Chief Executive Officer and Chief Financial Officer, does not expect that our internal controls will prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of internal controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Also, any evaluation of the effectiveness of controls in future periods are subject to the risk that those internal controls may become inadequate because of changes in business conditions, or that the degree of compliance with the policies or procedures may deteriorate.

## PART II. OTHER INFORMATION

### ITEM 1. LEGAL PROCEEDINGS

Information with respect to this item may be found in Note 12, "Commitments and Contingencies" in the Notes to Condensed Consolidated Financial Statements in Part I, Item 1 of this report and is incorporated herein by reference.

### ITEM 1A. RISK FACTORS

*You should carefully consider the followings risks when considering an investment in our Common Stock. These risks could materially affect our business, results of operations or financial condition, cause the trading price of our Common Stock to decline materially or cause our actual results to differ materially from those expected or those expressed in any forward-looking statements made by us. These risks are not exclusive, and additional risks to which we are subject include, but are not limited to, the factors mentioned under "Forward-Looking Statements" of our Annual Report on Form 10-K for the fiscal year ended September 29, 2018 and the risk of our businesses described elsewhere in this quarterly report. Additionally, these risks and uncertainties described herein are not the only ones facing us. Other events that we do not currently anticipate or that we currently deem immaterial also may affect our business, results of operations or financial condition.*

**Our operating results, including net sales, net income (loss) and adjusted EBITDA in dollars and as a percentage of net sales, as well as our stock price have varied in the past, and our future operating results will continue to be subject to quarterly and annual fluctuations based upon numerous factors, including those discussed in this Item 1A and throughout this report. Our stock price will continue to be subject to daily variations as well. Our future operating results and stock price may not follow any past trends or meet our guidance and expectations.**

Our net sales and operating results, such as adjusted EBITDA percentage, net income (loss) and operating expenses, and our stock price have varied in the past and may vary significantly from quarter to quarter and from year to year in the future. We believe a number of factors, many of which are outside of our control, could cause these variations and make them difficult to predict, including:

- general economic uncertainties in the macroeconomic and local economies facing us, our customers and the markets we serve, particularly in China and the Eurozone;
- impact of government economic policies on macroeconomic conditions, including recently instituted, proposed or threatened changes in trade policies by the U.S. and any corresponding retaliatory actions by affected countries, in particular with respect to China;
- fluctuations in demand for our products or downturns in the industries that we serve;
- the ability of our suppliers, both internal and external, to produce and deliver components and parts, including sole or limited source components, in a timely manner, in the quantity, quality and prices desired;
- the timing of receipt of bookings and the timing of and our ability to ultimately convert bookings to net sales;
- the concentration of a significant amount of our backlog, and resultant net sales, with a few customers in the Microelectronics market;
- rescheduling of shipments or cancellation of orders by our customers;
- fluctuations in our product mix;
- the ability of our customers' other suppliers to provide sufficient material to support our customers' products;
- currency fluctuations and stability, in particular the Euro, the Japanese Yen, the South Korean Won, the Chinese RMB and the U.S. Dollar as compared to other currencies;
- commodity pricing;
- interpretation and impact of the U.S. Tax Cuts and Jobs Act;

- introductions of new products and product enhancements by our competitors, entry of new competitors into our markets, pricing pressures and other competitive factors;
- our ability to develop, introduce, manufacture and ship new and enhanced products in a timely manner without defects;
- our ability to manage our manufacturing capacity across our diverse product lines and that of our suppliers, including our ability to successfully expand our manufacturing capacity in various locations around the world;
- our ability to successfully and fully integrate acquisitions, such as the historical Rofin businesses, into our operations and management;
- our ability to successfully internally transfer products as part of our integration efforts;
- our reliance on contract manufacturing;
- our reliance in part upon the ability of our OEM customers to develop and sell systems that incorporate our laser products;
- our customers' ability to manage their susceptibility to adverse economic conditions;
- the rate of market acceptance of our new products;
- the ability of our customers to pay for our products;
- expenses associated with acquisition-related activities;
- seasonal sales trends, including with respect to Rofin's historical business, which has traditionally experienced a reduction in sales during the first half of its fiscal year as compared to the second half of its fiscal year;
- jurisdictional capital and currency controls negatively impacting our ability to move funds from or to an applicable jurisdiction;
- access to applicable credit markets by us, our customers and their end customers;
- the impact of rising Chinese consumer debt and eroding consumer confidence and spending in China;
- delays or reductions in customer purchases of our products in anticipation of the introduction of new and enhanced products by us or our competitors;
- our ability to control expenses;
- the level of capital spending of our customers;
- potential excess and/or obsolescence of our inventory;
- costs and timing of adhering to current and developing governmental regulations and reviews relating to our products and business, including import and export regulations in multiple jurisdictions;
- costs related to acquisitions of technology or businesses;
- impairment of goodwill, intangible assets and other long-lived assets;
- our ability to meet our expectations and forecasts and those of public market analysts and investors;
- the availability of research funding by governments with regard to our customers in the scientific business, such as universities;

- continued government spending on defense-related and scientific research projects where we are a subcontractor;
- maintenance of supply relating to products sold to the government on terms which we would prefer not to accept;
- changes in policy, interpretations, or challenges to the allowability of costs incurred under government cost accounting standards;
- our ability and the ability of our contractual counterparts to comply with the terms of our contracts;
- damage to our reputation as a result of coverage in social media, Internet blogs or other media outlets;
- managing our and other parties' compliance with contracts in multiple languages and jurisdictions;
- managing our internal and third party sales representatives and distributors, including compliance with all applicable laws;
- costs, expenses and damages arising from litigation;
- costs associated with designing around or payment of licensing fees associated with issued patents in our fields of business;
- individual employees intentionally or negligently failing to comply with our internal controls;
- government support of alternative energy industries, such as solar;
- negative impacts related to the "Brexit" vote by the United Kingdom, particularly with regard to sales from our Glasgow, Scotland facility to other jurisdictions and purchases of supplies from outside the United Kingdom by such facility;
- negative impacts related to the recent independence movement in Catalonia, Spain, particularly with regard to holding and operating some of our foreign entities in an efficient manner from a tax, business and legal perspective;
- negative impacts related to government instability in any jurisdiction in which we operate, such as the recent difficulties in forming a governing coalition in Germany;
- the future impact of legislation, rulemaking, and changes in accounting, tax, defense procurement and export policies; and
- distraction of management related to acquisition, integration or divestment activities.

In addition, we often recognize a substantial portion of our sales in the last month of our fiscal quarters. Our expenses for any given quarter are typically based on expected sales, and if sales are below expectations in any given quarter, the adverse impact of the shortfall on our operating results may be magnified by our inability to adjust spending quickly enough to compensate for the shortfall. We also base our manufacturing on our forecasted product mix for the quarter. If the actual product mix varies significantly from our forecast, we may not be able to fill some orders during that quarter, which would result in delays in the shipment of our products. Accordingly, variations in timing of sales, particularly for our higher priced, higher margin products, can cause significant fluctuations in quarterly operating results.

Due to these and other factors, such as varying product mix, we believe that quarter-to-quarter and year-to-year comparisons of our historical operating results may not be meaningful. You should not rely on our results for any quarter or year as an indication of our future performance. Our operating results in future quarters and years may be below public market analysts' or investors' expectations, which would likely cause the price of our stock to fall. In addition, over the past several years, U.S. and global equity markets have experienced significant price and volume fluctuations that have affected the stock prices of many technology companies both in and outside our industry. There has not always been a direct correlation between this volatility and the performance of particular companies subject to these stock price fluctuations. These factors, as well as general economic and political conditions or investors' concerns regarding the credibility of corporate financial statements, may have a material adverse effect on the market price of our stock in the future.

***We depend on sole source or limited source suppliers, as well as on our own production capabilities, for some of the key components and materials, including exotic materials, certain cutting-edge optics and crystals, used in our products, which make us susceptible to supply shortages or price fluctuations that could adversely affect our business, particularly our ability to meet our customers' delivery requirements.***

We currently purchase several key components and materials used in the manufacture of our products from sole source or limited source suppliers. In particular, from time-to-time our customers require us to ramp up production and/or accelerate delivery schedules of our products. Our key suppliers may not have the ability to increase their production in line with our customers' demands. This can become acute during times of high growth in our customers' businesses. Our failure to timely receive these key components and materials would likely cause delays in the shipment of our products, which would likely negatively impact both our customers and our business. Some of these suppliers are relatively small private companies that may discontinue their operations at any time and which may be particularly susceptible to prevailing economic conditions. Some of our suppliers are located in regions which may be susceptible to natural disasters, such as the flooding in Thailand and the earthquake, tsunami and resulting nuclear disaster in Japan and severe flooding and power loss in the Eastern part of the United States in recent years. We typically purchase our components and materials through purchase orders or agreed upon terms and conditions and we do not have guaranteed supply arrangements with many of these suppliers. For certain long-lead time supplies or in order to lock-in pricing, we may be obligated to place non-cancellable purchase orders or otherwise assume liability for a large amount of the ordered supplies, which limits our ability to adjust down our inventory liability in the event of market downturns or other customer cancellations or rescheduling of their purchase orders for our products.

Some of our products, particularly in the flat panel display industry, require designs and specifications that are at the cutting-edge of available technologies and change frequently to meet rapidly evolving market demands. By their very nature, the types of components used in such products can be difficult and unpredictable to manufacture and may only be available from a single supplier, which increases the risk that we may not obtain such components in a timely manner. Identifying alternative sources of supply for certain components could be difficult and costly, result in management distraction in assisting our current and future suppliers to meet our and our customers' technical requirements, and cause delays in shipments of our products while we identify, evaluate and test the products of alternative suppliers. Any such delay in shipment would result in a delay or cancellation of our ability to convert such order into revenues. Furthermore, financial or other difficulties faced by these suppliers or significant changes in demand for these components or materials could limit their availability. We continue to consolidate our supply base and move supplier locations. When we transition locations we may increase our inventory of such products as a "safety stock" during the transition, which may cause the amount of inventory reflected on our balance sheet to increase. Additionally, many of our customers rely on sole source suppliers. In the event of a disruption of our customers' supply chain, orders from our customers could decrease or be delayed.

Any interruption or delay in the supply of any of these components or materials, or the inability to obtain these components and materials from alternate sources at acceptable prices and within a reasonable amount of time, or our failure to properly manage these moves, would impair our ability to meet scheduled product deliveries to our customers and could cause customers to cancel orders. Furthermore, we have historically relied exclusively on our own production capability to manufacture certain strategic components, crystals, semiconductor lasers, fiber, lasers and laser-based systems. We also manufacture certain large format optics. Because we manufacture, package and test these components, products and systems at our own facilities, and such components, products and systems are not readily available from other sources, any interruption in manufacturing would adversely affect our business. Since many of our products have lengthy qualification periods, our ability to introduce multiple suppliers for parts may be limited. In addition, our failure to achieve adequate manufacturing yields of these items at our manufacturing facilities may materially and adversely affect our operating results and financial condition.

***We participate in the microelectronics market, which requires significant research and development expenses to develop and maintain products and a failure to achieve market acceptance for our products could have a significant negative impact on our business and results of operations.***

The microelectronics market is characterized by rapid technological change, frequent product introductions, the volatility of product supply and demand, changing customer requirements and evolving industry standards. The nature of this market requires significant research and development expenses to participate, with substantial resources invested in advance of material sales of our products to our customers in this market. Additionally, our product offerings may become obsolete given the frequent introduction of alternative technologies. In the event either our customers' or our products fail to gain market acceptance, or the microelectronics market fails to grow, it would likely have a significant negative effect on our business and results of operations.

***We participate in the flat panel display market, which has a relatively limited number of end customer manufacturers. Our backlog, timing of net sales and results of operations could be negatively impacted in the event we face any significant periods with few or no orders or our customers reschedule or cancel orders.***

In the flat panel display market, there are a relatively limited number of manufacturers who are the end customers for our annealing products. In the second quarter and first six months of fiscal 2019, Advanced Process Systems Corporation, an integrator in the flat panel display market based in South Korea, contributed more than 10% of our revenue. In the second quarter of fiscal 2019, The Japan Steel Works, LTD., an integrator in the flat panel display market based in Japan, contributed more than 10% of our revenue. Given macroeconomic conditions, varying consumer demand and technical process limitations at manufacturers, we may see fluctuations in orders, including periods with no or few orders, and our customers may seek to reschedule or cancel orders. For example, in the fourth quarter of fiscal 2018, a customer requested a change of delivery date resulting in a significant order being rescheduled from the first to the second quarter of fiscal 2019. In addition, in the first quarter of fiscal 2019, one customer cancelled three purchase orders which included backlog shippable within 12 months of $38.2 million as well as some additional orders which were unscheduled.

These larger flat panel-related systems have large average selling prices. Any significant periods with few or no orders or any rescheduling or canceling of such orders by our customers will likely have a significant impact on our quarterly or annual net sales and results of operations and could negatively impact inventory values and backlog. Additionally, challenges in meeting evolving technological requirements for these complex products by us and our suppliers could also result in delays in shipments and rescheduled or cancelled orders by our customers. This could negatively impact our backlog, timing of net sales and results of operations.

As of March 30, 2019, flat panel display systems represented 25% of our backlog. Since our backlog includes higher average selling price flat panel display systems compared to other products in our backlog, any delays or cancellation of shipments could have a material adverse effect on our financial results.

***We may not be able to integrate the business of Rofin successfully with our own, realize the anticipated benefits of the merger or manage our expanded operations, any of which would adversely affect our results of operations.***

We have devoted, and expect to continue to devote, significant management attention and resources to integrating our business practices with those of Rofin. Such integration efforts are costly due to the large number of processes, policies, procedures, locations, operations, technologies and systems to be integrated, including purchasing, accounting and finance, sales, service, operations, payroll, pricing, marketing and employee benefits. Integration expenses could, particularly in the short term, exceed the savings we expect to achieve from the elimination of duplicative expenses and the realization of economies of scale, which could result in significant charges to earnings that we cannot currently quantify. Potential difficulties that we may encounter as part of the integration process include the following:

- the inability to successfully combine our business with Rofin in a manner that permits the combined company to achieve the full synergies and other benefits anticipated to result from the merger;
- complexities associated with managing the combined businesses, including difficulty addressing possible differences in corporate cultures and management philosophies and the challenge of integrating products, services, complex and different information technology systems (including different Enterprise Management Systems), control and compliance processes, technology, networks and other assets of each of the companies in a cohesive manner;
- diversion of the attention of our management; and
- the disruption of, or the loss of momentum in, our business or inconsistencies in standards, controls, procedures or policies.

Any of the foregoing could adversely affect our ability to maintain relationships with customers, suppliers, employees and other constituencies or our ability to achieve the anticipated benefits of the merger, or could reduce our earnings or otherwise adversely affect our business and financial results. For example, in the fourth quarter of fiscal 2018, difficulties in implementing our Enterprise Management Systems at one of our manufacturing sites located in Germany, which was historically part of Rofin, resulted in a shortage of manufacturing parts and shippable inventory to meet demands, resulting in a reduction of revenue for that quarter. If similar difficulties arise in the future and we are unable to resolve them in a timely manner, we may in the future experience a shortage of parts and inventory or otherwise be unable to meet demand, which could have a material adverse impact on our results of operations.

Following the merger, the size and complexity of the business of the combined company has increased significantly. Our future success depends, in part, upon our ability to manage this expanded business, which has and will pose substantial challenges for management, including challenges related to the management and monitoring of new operations and associated increased costs and complexity. There can be no assurances that we will be successful or that we will realize the expected synergies and benefits anticipated from the merger.

***Charges to earnings resulting from the application of the purchase method of accounting to the Rofin acquisition may adversely affect our results of operations.***

In accordance with generally accepted accounting principles, we have accounted for the Rofin acquisition using the purchase method of accounting. Under the purchase method of accounting, we allocated the total purchase price of Rofin's net tangible and identifiable intangible assets based upon their estimated fair values at the acquisition date. The excess of the purchase price over net tangible and identifiable intangible assets was recorded as goodwill. We have incurred and will continue to incur additional depreciation and amortization expense over the useful lives of certain of the net tangible and intangible assets acquired in connection with the acquisition. In addition, to the extent the value of goodwill or intangible assets with indefinite lives becomes impaired, we may be required to incur material charges relating to the impairment of those assets. These depreciation, amortization and potential impairment charges could have a material impact on our results of operations.

***Our indebtedness following the Rofin merger is substantially greater than our indebtedness prior to the merger. This increased level of indebtedness could adversely affect us, including by decreasing our business flexibility, and will increase our borrowing costs.***

In November 2016 we entered into the Credit Agreement which provided for a 670.0 million Euro term loan, all of which was drawn, and a $100 million revolving credit facility, under which a 10 million Euro letter of credit was issued. As of March 30, 2019, 368.3 million Euros were outstanding under the term loan. As of March 30, 2019, the revolving credit facility had been used for guarantees of 10.0 million Euros as well as borrowings of $40.0 million. We may incur additional indebtedness in the future by accessing the revolving credit facility and/or entering into new financing arrangements. Our ability to pay interest and repay the principal of our current indebtedness is dependent upon our ability to manage our business operations and the ongoing interest rate environment. There can be no assurance that we will be able to manage any of these risks successfully.

The Credit Agreement contains customary affirmative covenants, including covenants regarding the payment of taxes and other obligations, maintenance of insurance, reporting requirements and compliance with applicable laws and regulations, and negative covenants, including covenants limiting the ability of us and our subsidiaries to, among other things, incur debt, grant liens, make investments, make certain restricted payments, transact with affiliates, and sell assets. The Credit Agreement also requires us and our subsidiaries to maintain a senior secured net leverage ratio as of the last day of each fiscal quarter of less of than or equal to 3.50 to 1.00. The Credit Agreement contains customary events of default that include, among other things, payment defaults, cross defaults with certain other indebtedness, violation of covenants, inaccuracy of representations and warranties in any material respect, change in control of us and Coherent Holding BV & Co. K.G. (formerly Coherent Holding GmbH), judgment defaults, and bankruptcy and insolvency events. If an event of default exists, the lenders may require the immediate payment of all obligations and exercise certain other rights and remedies provided for under the Credit Agreement, the other loan documents and applicable law. The acceleration of such obligations is automatic upon the occurrence of a bankruptcy and insolvency event of default. There can be no assurance that we will have sufficient financial resources or we will be able to arrange financing to repay our borrowings at such time.

Our substantially increased indebtedness and higher debt-to-equity ratio as a result of the Rofin merger in comparison to that prior to the merger will have the effect, among other things, of reducing our flexibility to respond to changing business and economic conditions and will increase our borrowing costs. In addition, the amount of cash required to service our increased indebtedness levels and thus the demands on our cash resources will be greater than the amount of cash flows required to service our indebtedness or that of Rofin individually prior to the merger. The increased levels of indebtedness could also reduce funds available for our investments in product development as well as capital expenditures, dividends, share repurchases and other activities and may create competitive disadvantages for us relative to other companies with lower debt levels.

***Some of our laser systems are complex in design and may contain defects that are not detected until deployed by our customers, which could increase our costs and reduce our net sales.***

Lasers and laser systems are inherently complex in design and require ongoing regular maintenance. The manufacture of our lasers, laser products and systems involves a highly complex and precise process. As a result of the technological complexity of our products, in particular our excimer laser annealing tools used in the flat panel display market, changes in our or our suppliers' manufacturing processes or the inadvertent use of defective materials by us or our suppliers could result in a material adverse effect on our ability to achieve acceptable manufacturing yields and product reliability. To the extent that we do not achieve and maintain our projected yields or product reliability, our business, operating results, financial condition and customer relationships would be adversely affected. We provide warranties on a majority of our product sales, and reserves for estimated warranty costs are recorded during the period of sale. The determination of such reserves requires us to make estimates of failure rates and expected costs to repair or replace the products under warranty. We typically establish warranty reserves based on historical warranty costs for each product line. If actual return rates and/or repair and replacement costs differ significantly from our estimates, adjustments to cost of sales may be required in future periods which could have an adverse effect on our results of operations.

Our customers may discover defects in our products after the products have been fully deployed and operated, including under the end user's peak stress conditions. In addition, some of our products are combined with products from other vendors, which may contain defects. As a result, should problems occur, it may be difficult to identify the source of the problem. If we are unable to identify and fix defects or other problems, we could experience, among other things:

- loss of customers or orders;
- increased costs of product returns and warranty expenses;
- damage to our brand reputation;
- failure to attract new customers or achieve market acceptance;
- diversion of development, engineering and manufacturing resources; and
- legal actions by our customers and/or their end users.

The occurrence of any one or more of the foregoing factors could seriously harm our business, financial condition and results of operations.

***Continued volatility in the advanced packaging and semiconductor manufacturing markets could adversely affect our business, financial condition and results of operations.***

A portion of our net sales in the microelectronics market depends on the demand for our products by advanced packaging applications and semiconductor equipment companies. These markets have historically been characterized by sudden and severe cyclical variations in product supply and demand, which have often severely affected the demand for semiconductor manufacturing equipment, including laser-based tools and systems. The timing, severity and duration of these market cycles are difficult to predict, and we may not be able to respond effectively to these cycles. The continuing uncertainty in these markets severely limits our ability to predict our business prospects or financial results in these markets.

During industry downturns, our net sales from these markets may decline suddenly and significantly. Our ability to rapidly and effectively reduce our cost structure in response to such downturns is limited by the fixed nature of many of our expenses in the near term and by our need to continue our investment in next-generation product technology and to support and service our products. In addition, due to the relatively long manufacturing lead times for some of the systems and subsystems we sell to these markets, we may incur expenditures or purchase raw materials or components for products we cannot sell. Accordingly, downturns in the semiconductor capital equipment market may materially harm our operating results. Conversely, when upturns in these markets occur, we must be able to rapidly and effectively increase our manufacturing capacity to meet increases in customer demand that may be extremely rapid, and if we fail to do so we may lose business to our competitors and our relationships with our customers may be harmed.

***Worldwide economic conditions and related uncertainties could negatively impact demand for our products and results of operations.***

Volatility and disruption in the capital and credit markets, depressed consumer confidence, government economic policies, negative economic conditions, volatile corporate profits and reduced capital spending could negatively impact demand for our products. In particular, it is difficult to develop and implement strategy, sustainable business models and efficient operations, as well as effectively manage supply chain relationships, in the face of such conditions, including uncertainty regarding the ability of some of our suppliers to continue operations and provide us with uninterrupted supply flow. Our ability to maintain our research and development investments in our broad product offerings may be adversely impacted in the event that our future sales decline or remain flat. Spending and the timing thereof by consumers and businesses have a significant impact on our results and, where such spending is delayed or cancelled, it could have a material negative impact on our operating results. Current global economic conditions remain uncertain and challenging. Weakness in our end markets could negatively impact our net sales, gross margin and operating expenses, and consequently have a material adverse effect on our business, financial condition and results of operations.

Uncertainty in global fiscal policy has likely had an adverse impact on global financial markets and overall economic activity in recent years. Should this uncertain financial policy continue to occur or recur, it would likely negatively impact global economic activity going forward. Any weakness in global economies would also likely have negative repercussions on U.S. and global credit and financial markets, and further exacerbate sovereign debt concerns in the European Union. All of these factors would likely adversely impact the global demand for our products and the performance of our investments, and would likely have a material adverse effect on our business, results of operations and financial condition.

Financial turmoil affecting the banking system and financial markets, as has occurred in recent years, could result in tighter credit markets and lower levels of liquidity in some financial markets. There could be a number of follow-on effects from a tightened credit environment on our business, including the insolvency of key suppliers or their inability to obtain credit to finance development and/or manufacture products resulting in product delays; inability of customers to obtain credit to finance purchases of our products and/or customer insolvencies; and failure of financial institutions negatively impacting our treasury functions. In the event our customers are unable to obtain credit or otherwise pay for our shipped products it could significantly impact our ability to collect on our outstanding accounts receivable. Other income and expense also could vary materially from expectations depending on gains or losses realized on the sale or exchange of financial instruments; impairment charges resulting from revaluations of debt and equity securities and other investments; interest rates; cash balances; and changes in fair value of derivative instruments. Volatility in the financial markets and any overall economic uncertainty increase the risk that the actual amounts realized in the future on our financial instruments could differ significantly from the fair values currently assigned to them. Uncertainty about global economic conditions could also continue to increase the volatility of our stock price.

In addition, political and social turmoil related to international conflicts, terrorist acts, civil unrest and mass migration may put further pressure on economic conditions in the United States and the rest of the world. Unstable economic, political and social conditions make it difficult for our customers, our suppliers and us to accurately forecast and plan future business activities. If such conditions persist, our business, financial condition and results of operations could suffer. Additionally, unstable economic conditions can provide significant pressures and burdens on individuals, which could cause them to engage in inappropriate business conduct. See "Part I, Item 4. Controls and Procedures."

***Our cash and cash equivalents and short-term investments are managed through various banks around the world and volatility in the capital and credit market conditions could cause financial institutions to fail or materially harm service levels provided by such banks, both of which could have an adverse impact on our ability to timely access funds.***

World capital and credit markets have been and may continue to experience volatility and disruption. In some cases, the markets have exerted downward pressure on stock prices and credit capacity for certain issuers, as well as pressured the solvency of some financial institutions. These financial institutions, including banks, have had difficulty timely performing regular services and in some cases have failed or otherwise been largely taken over by governments. We maintain our cash, cash equivalents and short-term investments with a number of financial institutions around the world. Should some or all of these financial institutions fail or otherwise be unable to timely perform requested services, we would likely have limited ability to timely access our cash deposited with such institutions, or, in extreme circumstances the failure of such institutions could cause us to be unable to access cash for the foreseeable future. If we are unable to quickly access our funds when we need them, we may need to increase the use of our existing credit lines or access more expensive credit, if available. If we are unable to access our cash or if we access existing or additional credit or are unable to access additional credit, it could have a negative impact on our operations, including our reported net income. In addition, the willingness of financial institutions to continue to accept our cash deposits will impact our ability to diversify our investment risk among institutions.

***We are exposed to credit risk and fluctuations in the market values of our investment portfolio.***

Although we have not recognized any material losses on our cash, cash equivalents and short-term investments, future declines in their market values could have a material adverse effect on our financial condition and operating results. Given the global nature of our business, we have investments both domestically and internationally. There has recently been growing pressure on the creditworthiness of sovereign nations, particularly in Europe where a significant portion of our cash, cash equivalents and short-term investments are invested, which results in corresponding pressure on the valuation of the securities issued by such nations. Additionally, our overall investment portfolio is often concentrated in government-issued securities such as U.S. Treasury securities and government agencies, corporate notes, commercial paper and money market funds. Credit ratings and pricing of these investments can be negatively impacted by liquidity, credit deterioration or losses, financial results, or other factors. Additionally, liquidity issues or political actions by sovereign nations could result in decreased values for our investments in certain government securities. As a result, the value or liquidity of our cash, cash equivalents and short-term investments could decline or become materially impaired, which could have a material adverse effect on our financial condition and operating results. See "Part I, Item 3. Quantitative and Qualitative Disclosures about Market Risk."

***Our future success depends on our ability to increase our sales volumes and decrease our costs to offset potential declines in the average selling prices ("ASPs") of our products and, if we are unable to realize greater sales volumes and lower costs, our operating results may suffer.***

Our ability to increase our sales volume and our future success depends on the continued growth of the markets for lasers, laser systems and related accessories, as well as our ability to identify, in advance, emerging markets for laser-based systems and to manage our manufacturing capacity to meet customer demands. We cannot assure you that we will be able to successfully identify, on a timely basis, new high-growth markets in the future. Moreover, we cannot assure you that new markets will develop for our products or our customers' products, or that our technology or pricing will enable such markets to develop. Future demand for our products is uncertain and will depend to a great degree on continued technological development and the introduction of new or enhanced products. If this does not continue, sales of our products may decline and our business will be harmed.

We have in the past experienced decreases in the ASPs of some of our products. As competing products become more widely available, the ASPs of our products may decrease. If we are unable to offset any decrease in our ASPs by increasing our sales volumes, our net sales will decline. In addition, to maintain our gross margins, we must continue to reduce the cost of manufacturing our products while maintaining their high quality. From time to time, our products, like many complex technological products, may fail in greater frequency than anticipated. This can lead to further charges, which can result in higher costs, lower gross margins and lower operating results. Furthermore, as ASPs of our current products decline, we must develop and introduce new products and product enhancements with higher margins. If we cannot maintain our gross margins, our operating results could be seriously harmed, particularly if the ASPs of our products decrease significantly.

***Our future success depends on our ability to develop and successfully introduce new and enhanced products that meet the needs of our customers.***

Our current products address a broad range of commercial and scientific research applications in the photonics markets. We cannot assure you that the market for these applications will continue to generate significant or consistent demand for our products. Demand for our products could be significantly diminished by disrupting technologies or products that replace them or render them obsolete. Furthermore, the new and enhanced products in certain markets generally continue to be smaller in size and have lower ASPs, and therefore, we have to sell more units to maintain revenue levels. Accordingly, we must continue to invest in research and development in order to develop competitive products.

Our future success depends on our ability to anticipate our customers' needs and develop products that address those needs. Introduction of new products and product enhancements will require that we effectively transfer production processes from research and development to manufacturing and coordinate our efforts with those of our suppliers to achieve volume production rapidly. If we fail to transfer production processes effectively, develop product enhancements or introduce new products in sufficient quantities to meet the needs of our customers as scheduled, our net sales may be reduced and our business may be harmed.

***We face risks associated with our foreign operations and sales that could harm our financial condition and results of operations.***

For the three and six months ended March 30, 2019, 77% and 78%, respectively, of our net sales were derived from customers outside of the United States. For fiscal 2018, fiscal 2017 and fiscal 2016, 84%, 83%, and 76%, respectively, of our net sales were derived from customers outside of the United States. We anticipate that foreign sales, particularly in Asia, will continue to account for a significant portion of our net sales in the foreseeable future.

A global economic slowdown or a natural disaster could have a negative effect on various foreign markets in which we operate, such as the earthquake, tsunami and resulting nuclear disaster in Japan and the flooding in Thailand in recent years. Such a slowdown may cause us to reduce our presence in certain countries, which may negatively affect the overall level of business in such countries. Our foreign sales are primarily through our direct sales force. Additionally, some foreign sales are made through foreign distributors and representatives. Our foreign operations and sales are subject to a number of risks, including:

- compliance with applicable import/export regulations, tariffs and trade barriers, including recently instituted or proposed changes in trade policies by the U.S. and any corresponding retaliatory actions by affected countries, in particular with respect to China;
- longer accounts receivable collection periods;
- the impact of recessions and other economic conditions in economies outside the United States, including, for example, recent dips in the manufacturing Purchasing Managers' Index in the Eurozone, in particular in Germany;
- unexpected changes in regulatory requirements;
- certification requirements;
- environmental regulations;
- reduced protection for intellectual property rights in some countries;
- potentially adverse tax consequences;
- political and economic instability;
- compliance with applicable United States and foreign anti-corruption laws;
- less than favorable contract terms;
- reduced ability to enforce contractual obligations;
- cultural and management differences;
- reliance in some jurisdictions on third party sales channel partners;
- preference for locally produced products; and
- shipping and other logistics complications.

Our business could also be impacted by international conflicts, terrorist and military activity including, in particular, any such conflicts on the Korean peninsula, civil unrest and pandemic illness, any of which could cause a slowdown in customer orders, cause customer order cancellations or negatively impact availability of supplies or limit our ability to timely service our installed base of products.

We are also subject to the risks of fluctuating foreign currency exchange rates, which could materially adversely affect the sales price of our products in foreign markets, as well as the costs and expenses of our foreign subsidiaries. While we use forward exchange contracts and other risk management techniques to hedge our foreign currency exposure, we remain exposed to the economic risks of foreign currency fluctuations.

***If we are unable to protect our proprietary technology, our competitive advantage could be harmed.***

Maintenance of intellectual property rights and the protection thereof is important to our business. We rely on a combination of patent, copyright, trademark and trade secret laws and restrictions on disclosure to protect our intellectual property rights. Our patent applications may not be approved, any patents that may be issued may not sufficiently protect our intellectual property and any issued patents may be challenged by third parties. Other parties may independently develop similar or competing technology or design around any patents that may be issued to us. We cannot be certain that the steps we have taken will prevent the misappropriation of our intellectual property, particularly in foreign countries where the laws may not protect our proprietary rights as fully as in the United States. Further, we may be required to enforce our intellectual property or other proprietary rights through litigation, which, regardless of success, could result in substantial costs and diversion of management's attention. Additionally, there may be existing patents of which we are unaware that could be pertinent to our business and it is not possible for us to know whether there are patent applications pending that our products might infringe upon since these applications are often not publicly available until a patent is issued or published.

***We may, in the future, be subject to claims or litigation from third parties, for claims of infringement of their proprietary rights or to determine the scope and validity of our proprietary rights or the proprietary rights of competitors or other rights holders. These claims could result in costly litigation and the diversion of our technical and management personnel. Adverse resolution of litigation may harm our operating results or financial condition.***

In recent years, there has been significant litigation in the United States and around the world involving patents and other intellectual property rights. This has been seen in our industry, for example in the concluded patent-related litigation between IMRA America, Inc. ("Imra") and IPG Photonics Corporation and in Imra's concluded patent-related litigation against two of our German subsidiaries. From time to time, like many other technology companies, we have received communications from other parties asserting the existence of patent rights, copyrights, trademark rights or other intellectual property rights which such third parties believe may cover certain of our products, processes, technologies or information. In the future, we may be a party to litigation to protect our intellectual property or as a result of an alleged infringement of others' intellectual property whether through direct claims or by way of indemnification claims of our customers, as, in some cases, we contractually agree to indemnify our customers against third-party infringement claims relating to our products. These claims and any resulting lawsuit, if successful, could subject us to significant liability for damages or invalidation of our proprietary rights. These lawsuits, regardless of their success, would likely be time-consuming and expensive to resolve and would divert management time and attention. Any potential intellectual property litigation could also force us to do one or more of the following:

- stop manufacturing, selling or using our products that use the infringed intellectual property;
- obtain from the owner of the infringed intellectual property right a license to sell or use the relevant technology, although such license may not be available on reasonable terms, or at all; or
- redesign the products that use the technology.

If we are forced to take any of these actions or are otherwise a party to lawsuits of this nature, we may incur significant losses and our business may be seriously harmed. We do not have insurance to cover potential claims of this type.

***If our goodwill or intangible assets become impaired, we may be required to record a significant charge to earnings.***

Under accounting principles generally accepted in the United States, we review our intangible assets for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Goodwill is required to be tested for impairment at least annually. Factors that may be considered in determining whether a change in circumstances indicating that the carrying value of our goodwill or other intangible assets may not be recoverable include declines in our stock price and market capitalization or future cash flows projections. A decline in our stock price, or any other adverse change in market conditions, particularly if such change has the effect of changing one of the critical assumptions or estimates we used to calculate the estimated fair value of our reporting units, could result in a change to the estimation of fair value that could result in an impairment charge. Any such material charges, whether related to goodwill or purchased intangible assets, may have a material negative impact on our financial and operating results.

***We depend on skilled personnel to operate our business effectively in a rapidly changing market, and if we are unable to retain existing or hire additional personnel when needed, or manage transitions among members of our leadership team, in particular the recently announced upcoming transition of our President and Chief Executive Officer, our ability to develop and sell our products could be harmed.***

Our ability to continue to attract and retain highly skilled personnel will be a critical factor in determining whether we will be successful in the future. Recruiting and retaining highly skilled personnel in certain functions continues to be difficult. At certain locations where we operate, the cost of living is extremely high and it may be difficult to retain key employees and management at a reasonable cost. We may not be successful in attracting, assimilating or retaining qualified personnel to fulfill our current or future needs, which could adversely affect our growth and our business.

Our future success depends upon the continued services of our executive officers and other key engineering, sales, marketing, manufacturing and support personnel, any of whom may leave and our ability to effectively transition to their successors. In April 2019, we announced that John Ambroseo will transition from being our President and Chief Executive Officer, a position he has served in since 2002, to a special advisor to the Company no later than April 2021. In November 2018, we also announced that Paul Sechrist will transition from being our Executive Vice President, Worldwide Sales and Service, a position he has served in since 2011, to a special advisor to our Chief Executive Officer on or about the end of fiscal 2019. We can provide no assurance that we will be able to find suitable successors to these roles, in particular the role of Chief Executive

Officer, or that any identified successors will be successfully integrated into our management team. Our inability to do so, or to retain other key employees or effectively transition to their successors could harm our business and our results of operations.

***The long sales cycles for our products may cause us to incur significant expenses without offsetting net sales.***

Customers often view the purchase of our products as a significant and strategic decision. As a result, customers typically expend significant effort in evaluating, testing and qualifying our products before making a decision to purchase them, resulting in a lengthy initial sales cycle. While our customers are evaluating our products and before they place an order with us, we may incur substantial sales and marketing and research and development expenses to customize our products to the customers' needs. We may also expend significant management efforts, increase manufacturing capacity and order long lead-time components or materials prior to receiving an order. Even after this evaluation process, a potential customer may not purchase our products. As a result, these long sales cycles may cause us to incur significant expenses without ever receiving net sales to offset such expenses.

***The markets in which we sell our products are intensely competitive and increased competition could cause reduced sales levels, reduced gross margins or the loss of market share.***

Competition in the various photonics markets in which we provide products is very intense. We compete against a number of large public and private companies, including IPG Photonics Corporation, Lumentum Holdings Inc., MKS Instruments, Inc., Novanta Inc., nlight, Inc. and Trumpf GmbH, as well as other smaller companies. Some of our competitors are large companies that have significant financial, technical, marketing and other resources. These competitors may be able to devote greater resources than we can to the development, promotion, sale and support of their products. Some of our competitors are much better positioned than we are to acquire other companies in order to gain new technologies or products that may displace our product lines. Any of these acquisitions could give our competitors a strategic advantage. Any business combinations or mergers among our competitors, forming larger companies with greater resources, could result in increased competition, price reductions, reduced margins or loss of market share, any of which could materially and adversely affect our business, results of operations and financial condition.

Additional competitors may enter the markets in which we serve, both foreign and domestic, and we are likely to compete with new companies in the future. For example, in recent years there have been a growing number of companies in China that are targeting our markets regionally, and may in the future be able to expand internationally. We may encounter potential customers that, due to existing relationships with our competitors, are committed to the products offered by these competitors. Further, our current or potential customers may determine to develop and produce products for their own use which are competitive to our products. Such vertical integration could reduce the market opportunity for our products. As a result of the foregoing factors, we expect that competitive pressures may result in price reductions, reduced margins, loss of sales and loss of market share. In addition, in markets where there are a limited number of customers, competition is particularly intense.

***If we fail to accurately forecast component and material requirements for our products, we could incur additional costs and incur significant delays in shipments, which could result in a loss of customers.***

We use rolling forecasts based on anticipated product orders and material requirements planning systems to determine our product requirements. It is very important that we accurately predict both the demand for our products and the lead times required to obtain the necessary components and materials. We depend on our suppliers for most of our product components and materials. Lead times for components and materials that we order vary significantly and depend on factors including the specific supplier requirements, the size of the order, contract terms and current market demand for components. For substantial increases in our sales levels of certain products, some of our suppliers may need at least nine months lead-time. If we overestimate our component and material requirements, we may have excess inventory, which would increase our costs. If we underestimate our component and material requirements, we may have inadequate inventory, which could interrupt and delay delivery of our products to our customers. Any of these occurrences would negatively impact our net sales, business or operating results.

***Our reliance on contract manufacturing and outsourcing may adversely impact our financial results and operations due to our decreased control over the performance and timing of certain aspects of our manufacturing.***

Our manufacturing strategy includes partnering with contract manufacturers to outsource non-core subassemblies and less complex turnkey products, including some performed at international sites located in Asia and Eastern Europe. Our ability to resume internal manufacturing operations for certain products and components in a timely manner may be eliminated. The cost, quality, performance and availability of contract manufacturing operations are and will be essential to the successful production and sale of many of our products. Our financial condition or results of operation could be adversely impacted if any contract manufacturer or other supplier is unable for any reason, including as a result of the impact of worldwide economic conditions, to meet our cost, quality, performance, and availability standards. We may not be able to provide contract manufacturers with product volumes that are high enough to achieve sufficient cost savings. If shipments fall below forecasted levels, we may incur increased costs or be required to take ownership of the inventory. Also, our ability to control the quality of products produced by contract manufacturers may be limited and quality issues may not be resolved in a timely manner, which could adversely impact our financial condition or results of operations.

***If we fail to effectively manage our growth or, alternatively, our spending during downturns, our business could be disrupted, which could harm our operating results.***

Growth in sales, combined with the challenges of managing geographically dispersed operations, can place a significant strain on our management systems and resources, and our anticipated growth in future operations could continue to place such a strain. The failure to effectively manage our growth could disrupt our business and harm our operating results. Our ability to successfully offer our products and implement our business plan in evolving markets requires an effective planning and management process. In economic downturns, we must effectively manage our spending and operations to ensure our competitive position during the downturn, as well as our future opportunities when the economy improves, remain intact. The failure to effectively manage our spending and operations could disrupt our business and harm our operating results.

***Historically, acquisitions have been an important element of our strategy. However, we may not find suitable acquisition candidates in the future and we may not be able to successfully integrate and manage acquired businesses. Any acquisitions we make could disrupt our business and harm our financial condition.***

We have in the past made strategic acquisitions of other corporations and entities, including Ondax in October 2018, OR Laser in March 2018 and Rofin in November 2016, as well as asset purchases, and we continue to evaluate potential strategic acquisitions of complementary companies, products and technologies. In the event of any future acquisitions, we could:

- issue stock that would dilute our current stockholders' percentage ownership;
- pay cash that would decrease our working capital;
- incur debt;
- assume liabilities; or
- incur expenses related to impairment of goodwill and amortization.

Acquisitions also involve numerous risks, including:

- problems combining the acquired operations, systems, technologies or products;
- an inability to realize expected operating efficiencies or product integration benefits;
- difficulties in coordinating and integrating geographically separated personnel, organizations, systems and facilities;
- difficulties integrating business cultures;
- unanticipated costs or liabilities, including the costs associated with improving the internal controls of the acquired company;
- diversion of management's attention from our core businesses;
- adverse effects on existing business relationships with suppliers and customers;
- potential loss of key employees, particularly those of the purchased organizations;
- incurring unforeseen obligations or liabilities in connection with acquisitions; and

- the failure to complete acquisitions even after signing definitive agreements which, among other things, would result in the expensing of potentially significant professional fees and other charges in the period in which the acquisition or negotiations are terminated.

We cannot assure you that we will be able to successfully identify appropriate acquisition candidates, to integrate any businesses, products, technologies or personnel that we might acquire in the future or achieve the anticipated benefits of such transactions, which may harm our business.

***Our market is unpredictable and characterized by rapid technological changes and evolving standards demanding a significant investment in research and development, and, if we fail to address changing market conditions, our business and operating results will be harmed.***

The photonics industry is characterized by extensive research and development, rapid technological change, frequent new product introductions, changes in customer requirements and evolving industry standards. Because this industry is subject to rapid change, it is difficult to predict its potential size or future growth rate. Our success in generating net sales in this industry will depend on, among other things:

- maintaining and enhancing our relationships with our customers;
- the education of potential end-user customers about the benefits of lasers and laser systems; and
- our ability to accurately predict and develop our products to meet industry standards.

We cannot assure you that our expenditures for research and development will result in the introduction of new products or, if such products are introduced, that those products will achieve sufficient market acceptance or to generate sales to offset the costs of development. Our failure to address rapid technological changes in our markets could adversely affect our business and results of operations.

***We are exposed to lawsuits in the normal course of business which could have a material adverse effect on our business, operating results, or financial condition.***

We are exposed to lawsuits in the normal course of our business, including product liability claims, if personal injury, death or commercial losses occur from the use of our products. As a public company our stock price fluctuates for a variety of different reasons, some of which may be related to broader industry and/or market factors. As a result, from time-to-time we may be subject to the risk of litigation due to the fluctuation in stock price or other governance or market-related factors. While we typically maintain business insurance, including directors' and officers' policies, litigation can be expensive, lengthy, and disruptive to normal business operations, including the potential impact of indemnification obligations for individuals named in any such lawsuits. We may not, however, be able to secure insurance coverage on terms acceptable to us in the future. Moreover, the results of complex legal proceedings are difficult to predict. An unfavorable resolution of a particular lawsuit, including a recall or redesign of products if ultimately determined to be defective, could have a material adverse effect on our business, operating results, or financial condition.

***We use standard laboratory and manufacturing materials that could be considered hazardous and we could be liable for any damage or liability resulting from accidental environmental contamination or injury.***

Although most of our products do not incorporate hazardous or toxic materials and chemicals, some of the gases used in our excimer lasers and some of the liquid dyes used in some of our scientific laser products are highly toxic. In addition, our operations involve the use of standard laboratory and manufacturing materials that could be considered hazardous. Also, if a facility fire were to occur at our Sunnyvale, California site and were to spread to a reactor used to grow semiconductor wafers, it could release highly toxic emissions. We believe that our safety procedures for handling and disposing of such materials comply with all federal, state and offshore regulations and standards. However, the risk of accidental environmental contamination or injury from such materials cannot be entirely eliminated. In the event of such an accident involving such materials, we could be liable for damages and such liability could exceed the amount of our liability insurance coverage and the resources of our business which could have an adverse effect on our financial results or our business as a whole.

***Compliance or the failure to comply with current and future environmental regulations could cause us significant expense.***

We are subject to a variety of federal, state, local and foreign environmental regulations relating to the use, storage, discharge and disposal of hazardous chemicals used during our manufacturing process or requiring design changes or recycling of products we manufacture. If we fail to comply with any present and future regulations, we could be subject to future liabilities, the suspension of production or a prohibition on the sale of products we manufacture. In addition, such regulations could restrict our ability to expand our facilities or could require us to acquire costly equipment, or to incur other significant expenses to comply with environmental regulations, including expenses associated with the recall of any non-compliant product and the management of historical waste.

From time to time new regulations are enacted, and it is difficult to anticipate how such regulations will be implemented and enforced. We continue to evaluate the necessary steps for compliance with regulations as they are enacted. These regulations include, for example, the Registration, Evaluation, Authorization and Restriction of Chemical substances ("REACH"), the Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive ("RoHS") and the Waste Electrical and Electronic Equipment Directive ("WEEE") enacted in the European Union, which regulate the use of certain hazardous substances in, and require the collection, reuse and recycling of waste from, certain products we manufacture. This and similar legislation that has been or is in the process of being enacted in Japan, China, South Korea and various states of the United States may require us to re-design our products to ensure compliance with the applicable standards, for example by requiring the use of different types of materials. These redesigns or alternative materials may detrimentally impact the performance of our products, add greater testing lead-times for product introductions or have other similar effects. We believe we comply with all such legislation where our products are sold, and we will continue to monitor these laws and the regulations being adopted under them to determine our responsibilities. In addition, we are monitoring legislation relating to the reduction of carbon emissions from industrial operations to determine whether we may be required to incur any additional material costs or expenses associated with our operations. We are not currently aware of any such material costs or expenses. The SEC has promulgated rules requiring disclosure regarding the use of certain "conflict minerals" mined from the Democratic Republic of Congo and adjoining countries and procedures regarding a manufacturer's efforts to prevent the sourcing of such minerals. The implementation of such rules has required us to incur additional expense and internal resources and may continue to do so in the future, particularly in the event that only a limited pool of suppliers are available to certify that products are free from "conflict minerals."  Our failure to comply with any of the foregoing regulatory requirements or contractual obligations could result in our being directly or indirectly liable for costs, fines or penalties and third-party claims, and could jeopardize our ability to conduct business in the United States and foreign countries.

***Our and our customers' operations would be seriously harmed if our logistics or facilities or those of our suppliers, our customers' suppliers or our contract manufacturers were to experience catastrophic loss.***

Our operations, logistics and facilities and those of our customers, suppliers and contract manufacturers could be subject to a catastrophic loss from fire, flood, earthquake, volcanic eruption, work stoppages, power outages, acts of war, pandemic illnesses, energy shortages, theft of assets, other natural disasters or terrorist activity. A substantial portion of our research and development activities, manufacturing, our corporate headquarters and other critical business operations are located near major earthquake faults in Santa Clara, California, an area with a history of seismic events. Any such loss or detrimental impact to any of our operations, logistics or facilities could disrupt our operations, delay production, shipments and net sales and result in large expenses to repair or replace the facility. While we have obtained insurance to cover most potential losses, after reviewing the costs and limitations associated with earthquake insurance, we have decided not to procure such insurance. We believe that this decision is consistent with decisions reached by numerous other companies located nearby. We cannot assure you that our existing insurance coverage will be adequate against all other possible losses.

***Difficulties with our enterprise resource planning ("ERP") system and other parts of our global information technology system could harm our business and results of operation. If our network security measures are breached and unauthorized access is obtained to a customer's data or our data or our information technology systems, we may incur significant legal and financial exposure and liabilities.***

Like many modern multinational corporations, we maintain a global information technology system, including software products licensed from third parties.  Any system, network or Internet failures, misuse by system users, the hacking into or disruption caused by the unauthorized access by third parties or loss of license rights could disrupt our ability to timely and accurately manufacture and ship products or to report our financial information in compliance with the timelines mandated by the SEC.  Any such failure, misuse, hacking, disruptions or loss would likely cause a diversion of management's attention from the underlying business and could harm our operations.  In addition, a significant failure of our global information technology system could adversely affect our ability to complete an evaluation of our internal controls and attestation activities pursuant to Section 404 of the Sarbanes-Oxley Act of 2002.

***Our information systems are subject to attacks, interruptions and failures.***

As part of our day-to-day business, we store our data and certain data about our customers in our global information technology system. While our system is designed with access security, if a third party gains unauthorized access to our data, including any regarding our customers, such a security breach could expose us to a risk of loss of this information, loss of business, litigation and possible liability. Our security measures may be breached as a result of third-party action, including intentional misconduct by computer hackers, employee error, malfeasance or otherwise. Additionally, third parties may attempt to fraudulently induce employees or customers into disclosing sensitive information such as user names, passwords or other information in order to gain access to our customers' data or our data, including our intellectual property and other confidential business information, or our information technology systems. Because the techniques used to obtain unauthorized access, or to sabotage systems, change frequently and generally are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. Any unauthorized access could result in a loss of confidence by our customers, damage our reputation, disrupt our business, lead to legal liability and negatively impact our future sales. Additionally, such actions could result in significant costs associated with loss of our intellectual property, impairment of our ability to conduct our operations, rebuilding our network and systems, prosecuting and defending litigation, responding to regulatory inquiries or actions, paying damages or taking other remedial steps.

***Changes in tax rates, tax liabilities or tax accounting rules could affect future results.***

As a global company, we are subject to taxation in the United States and various other countries and jurisdictions. Significant judgment is required to determine our worldwide tax liabilities. A number of factors may affect our future effective tax rates including, but not limited to:

- interpretation and impact of the recently enacted and aforementioned U.S. tax law, the Tax Cuts and Jobs Act (the "Tax Act");
- changes in our current and future global structure based on the Rofin acquisition and restructuring that involved significant movement of U.S. and foreign entities and our ability to maintain favorable tax treatment as a result of various Rofin restructuring efforts and business activities;
- the outcome of discussions with various tax authorities regarding intercompany transfer pricing arrangements;
- changes that involve other acquisitions, restructuring or an increased investment in technology outside of the United States to better align asset ownership and business functions with revenues and profits;
- changes in the composition of earnings in countries or states with differing tax rates;
- the resolution of issues arising from tax audits with various tax authorities, and in particular, the outcome of the German tax audits of Coherent and Rofin tax returns for fiscal 2010-2016 and South Korean tax audits of fiscal 2014-2017;
- adjustments to estimated taxes upon finalization of various tax returns;
- increases in expenses not deductible for tax purposes, including impairments of goodwill in connection with acquisitions;
- our ability to meet the eligibility requirements for tax holidays of limited time tax-advantage status;
- changes in available tax credits;
- changes in share-based compensation;
- changes in other tax laws or the interpretation of such tax laws, including the Base Erosion Profit Shifting action plan implemented by the Organization for Economic Co-operation and Development; and
- changes in generally accepted accounting principles.

As indicated above, we are engaged in discussions with various tax authorities regarding the appropriate level of profitability for Coherent entities and this may result in changes to our worldwide tax liabilities. In addition, we are subject to regular examination of our income tax returns by the Internal Revenue Service ("IRS") and other tax authorities. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. Although we believe our tax estimates are reasonable, there can be no assurance that any final determination will not be materially different from the treatment reflected in our historical income tax provisions and accruals, which could materially and adversely affect our operating results and financial condition.

From time to time the United States, foreign and state governments make substantive changes to tax rules and the application of rules to companies. For example, the Tax Act has a significant impact on the taxation of Coherent including the U.S. tax treatment of our foreign operations.

The recent U.S. tax law changes are subject to further interpretations from the U.S. federal and state governments and regulatory organizations, such as the Treasury Department and/or the Internal Revenue Service. Updated guidance and interpretations could change the provisional tax liabilities or the accounting treatment of them. We may pay the transition tax calculated under the Tax Act over a period of up to eight years.

***Changing laws, regulations and standards relating to corporate governance and public disclosure may create uncertainty regarding compliance matters.***

Federal securities laws, rules and regulations, as well as the rules and regulations of self-regulatory organizations such as NASDAQ and the NYSE, require companies to maintain extensive corporate governance measures, impose comprehensive reporting and disclosure requirements, set strict independence and financial expertise standards for audit and other committee members and impose civil and criminal penalties for companies and their chief executive officers, chief financial officers and directors for securities law violations. These laws, rules and regulations have increased and will continue to increase the scope, complexity and cost of our corporate governance, reporting and disclosure practices, which could harm our results of operations and divert management's attention from business operations. Changing laws, regulations and standards relating to corporate governance and public disclosure may create uncertainty regarding compliance matters. New or changed laws, regulations and standards are subject to varying interpretations in many cases. As a result, their application in practice may evolve over time. We are committed to maintaining high standards of ethics, corporate governance and public disclosure. Complying with evolving interpretations of new or changed legal requirements may cause us to incur higher costs as we revise current practices, policies and procedures, and may divert management time and attention from revenue generating to compliance activities. If our efforts to comply with new or changed laws, regulations and standards differ from the activities intended by regulatory or governing bodies due to ambiguities related to practice, our reputation may also be harmed.

***Governmental regulations, including tariffs and duties, affecting the import or export of products could negatively affect our business, financial condition and results of operations.***

The United States, Germany, the European Union, the United Kingdom, China, South Korea and many other foreign governments impose tariffs and duties on the import and export of products, including some of those which we sell. In particular, given our worldwide operations, we pay duties on certain products when they are imported into the United States for repair work as well as on certain of our products which are manufactured by our foreign subsidiaries. These products can be subject to a duty on the product value. Additionally, the United States and various foreign governments have imposed tariffs, controls, export license requirements and restrictions on the import or export of some technologies, especially encryption technology. From time to time, government agencies have proposed additional regulation of encryption technology, such as requiring the escrow and governmental recovery of private encryption keys. Governmental regulation of encryption technology and regulation of imports or exports, or our failure to obtain required import or export licenses or other approvals for our products, could harm our international and domestic sales and adversely affect our net sales.

The U.S. has recently instituted or proposed changes in trade policies that include the negotiation or termination of trade agreements, the imposition of higher tariffs on imports into the United States including, in particular, on Chinese goods, economic sanctions on individuals, corporations or countries and other government regulations affecting trade between the United States and other countries where we conduct our business. These policy changes and proposals could require time-consuming and expensive alterations to our business operations and may result in greater restrictions and economic disincentives on international trade, which could negatively impact our competitiveness in jurisdictions around the world as well as lead to an increase in costs in our supply chain. Given that we are a multinational corporation, with manufacturing located both in the United States and internationally, we may face additional susceptibility to negative impacts from these tariffs or change in trade policies regarding our inter-company trade practices. For example, we have recently seen a drop in export demand for our Chinese customers particularly in the materials processing space. As a result, some of these customers are reevaluating expansion plans and delaying and, in limited cases, cancelling orders. In addition, new tariffs and other changes in U.S. trade policy could trigger retaliatory actions by affected countries, and certain foreign governments, including the Chinese government (which has imposed retaliatory tariffs on a range of U.S. goods including certain photonics products), have instituted or are considering imposing trade sanctions on certain U.S. manufactured goods. Such changes by the United States and other countries have the potential to adversely impact U.S. and worldwide economic conditions, our industry and the global demand for our products, and as a result, could negatively affect our business, financial condition and results of operations.

As a multinational corporation, we may be subject to audits by tax, export and customs authorities, as well as other government agencies. For example, we were audited in South Korea for customs duties and value added tax for the period from March 2009 to March 2014. We were liable for additional payments, duties, taxes and penalties of $1.6 million, which we paid in the second quarter of fiscal 2016. Any future audits could lead to assessments that could have a material adverse effect on our business or financial position, results of operations, or cash flows.

In addition, compliance with the directives of the Directorate of Defense Trade Controls and other international jurisdictions' export control restrictions may result in substantial expenses and diversion of management's attention. Any failure to adequately address these directives could result in civil fines or suspension or loss of our export privileges, any of which could have a material adverse effect on our business or financial position, results of operations, or cash flows.

***Failure to maintain effective internal controls may cause a loss of investor confidence in the reliability of our financial statements or cause us to delay filing our periodic reports with the SEC and adversely affect our stock price.***

The SEC, as directed by Section 404 of the Sarbanes-Oxley Act of 2002, adopted rules requiring public companies to include a report of management on internal control over financial reporting in their annual reports on Form 10-K that contain an assessment by management of the effectiveness of our internal control over financial reporting. In addition, our independent registered public accounting firm must attest to and report on the effectiveness of our internal control over financial reporting. Although we test our internal control over financial reporting in order to ensure compliance with the Section 404 requirements, our failure to maintain adequate internal controls over financial reporting could result in an adverse reaction in the financial marketplace due to a loss of investor confidence in the reliability of our financial statements or a delay in our ability to timely file our periodic reports with the SEC, which ultimately could negatively impact our stock price.

***Provisions of our charter documents and Delaware law, and our Change-of-Control Severance Plan, may have anti-takeover effects that could prevent or delay a change in control.***

Provisions of our certificate of incorporation and bylaws, as well as the terms of our Change-of-Control Severance Plan, may discourage, delay or prevent a merger or acquisition, make a merger or acquisition more costly for a potential acquirer, or make removal of incumbent directors or officers more difficult. These provisions may discourage takeover attempts and bids for our common stock at a premium over the market price. These provisions include:

- the ability of our Board of Directors to alter our bylaws without stockholder approval;
- limiting the ability of stockholders to call special meetings; and
- establishing advance notice requirements for nominations for election to our Board of Directors or for proposing matters that can be acted on by stockholders at stockholder meetings.

We are subject to Section 203 of the Delaware General Corporation Law, which prohibits a publicly-held Delaware corporation from engaging in a merger, asset or stock sale or other transaction with an interested stockholder for a period of three years following the date such person became an interested stockholder, unless prior approval of our board of directors is obtained or as otherwise provided. These provisions of Delaware law also may discourage, delay or prevent someone from acquiring or merging with us without obtaining the prior approval of our board of directors, which may cause the market price of our common stock to decline. In addition, we have adopted a change of control severance plan, which provides for the payment of a cash severance benefit to each eligible employee based on the employee's position. If a change of control occurs, our successor or acquirer will be required to assume and agree to perform all of our obligations under the change of control severance plan which may discourage potential acquirers or result in a lower stock price.

## ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

***Sales of Unregistered Securities***

Not applicable.

***Purchases of Equity Securities by the Issuer and Affiliated Purchasers***

On November 6, 2018, we announced that our board of directors authorized a stock repurchase program authorizing the Company to repurchase up to $250.0 million of our common stock through December 31, 2019, with a limit of no more than $75.0 million per quarter. During the three months ended March 30, 2019, we repurchased and retired 199,826 shares of outstanding common stock under this program at an average price of $129.64 per share for a total of $25.9 million.

The following table summarizes share repurchase activity for the three months ended March 30, 2019:

| Period | Total Number of Shares Purchased | Average price paid per share | Total Number of Shares Purchased As Part of Publicly Announced Program | Maximum Approximate Dollar Value of Shares That May Yet Be Purchased Under the Program |
|---|---|---|---|---|
| December 30, 2018 - January 26, 2019 | — | $ — | — | $ 224,498,367 |
| January 27, 2019 - February 23, 2019 | 89,826 | $ 123.05 | 89,826 | $ 213,445,278 |
| February 24, 2019 - March 30, 2019 | 110,000 | $ 135.01 | 110,000 | $ 198,594,178 |
| Total | 199,826 | $ 129.64 | 199,826 | |

**ITEM 6. EXHIBITS**

| Exhibit No. | Description |
|---|---|
| 10.1‡ | Change of Control and Leadership Change Severance Plan, as amended and restated effective April 13, 2019. |
| 10.2‡ | CEO Transition and Retirement Agreement, dated April 13, 2019, between the Company and John Ambroseo. |
| 31.1 | Certification of Chief Executive Officer pursuant to Exchange Act Rule 13a-14(a)/15d-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. |
| 31.2 | Certification of Chief Financial Officer pursuant to Exchange Act Rule 13a-14(a)/15d-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. |
| 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 |
| 101.SCH | XBRL Taxonomy Extension Schema |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase |
| 101.DEF | XBRL Taxonomy Extension Definition Linkbase |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase |

‡ Identifies management contract or compensatory plans or arrangements required to be filed as an exhibit.

* Furnished herewith.

**COHERENT, INC.**

**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.

**Coherent, Inc.**
(Registrant)

| | | |
|---|---|---|
| Date: May 8, 2019 | /s/: | JOHN R. AMBROSEO |
| | | John R. Ambroseo |
| | | President and Chief Executive Officer |
| | | (Principal Executive Officer) |
| Date: May 8, 2019 | /s/: | KEVIN S. PALATNIK |
| | | Kevin S. Palatnik |
| | | Executive Vice President and Chief Financial Officer |
| | | (Principal Financial and Accounting Officer) |

Exhibit 10.1

# CHANGE OF CONTROL AND LEADERSHIP CHANGE SEVERANCE PLAN

## Introduction

The Board of Directors of Coherent, Inc., a Delaware corporation ("Company"), has evaluated the economic and social impact of an acquisition or other change of control or a change in leadership on its key employees. The Board recognizes that the potential of such an acquisition or change of control or change in leadership can be a distraction to its key employees and can cause them to consider alternative employment opportunities. The Board has determined that it is in the best interests of the Company and its stockholders to assure that the Company will have the continued dedication and objectivity of its key employees. The Board believes that the adoption of this amended and restated Plan will enhance the ability of the Company's key employees to assist the Board in objectively evaluating potential acquisitions or other changes of control and provide for an effective change in leadership.

Furthermore, the Board believes a change of control and leadership change severance plan of this kind will aid the Company in attracting and retaining the highly qualified, high performing individuals who are essential to its success. The plan will help ensure that key employees will be able to maintain productivity, objectivity and focus during the period of significant uncertainty that is inherent in an acquisition or other change of control or change in leadership and remain focused on driving a successful transition.

Accordingly, the following plan has been developed and is hereby adopted.

## ARTICLE I

## ESTABLISHMENT OF PLAN

1.1 Establishment of Plan. As of the Amendment Effective Date, the Company hereby amends and restates the "Change of Control Severance Plan" as the "Change of Control and Leadership Change Severance Plan" (the "Plan"), as set forth in this document. The purposes of the Plan are as set forth in the Introduction.

1.2 Applicability of Plan. The benefits provided by this Plan shall be available to certain key Employees of the Company who, at or after the Amendment Effective Date, meet the eligibility requirements of Article III.

1.3 Contractual Right to Benefits. This Plan establishes and vests in each Participant a contractual right to the benefits to which he or she is entitled hereunder, enforceable by the Participant against his or her Employer or the Company, or both.

## ARTICLE II

## DEFINITIONS AND CONSTRUCTION

2.1 Definitions. Whenever used in the Plan, the following terms shall have the meanings set forth below and, when the meaning is intended, the initial letter of the term is capitalized.

(a) "Amendment Effective Date" means April 13, 2019.

(b) "Base Pay" means the rate of annual base straight time gross earnings, exclusive of incentive compensation, incentive payments, bonuses, commissions or other compensation in effect immediately prior to the Change of Control (without regard to any reduction made In Anticipation of a Change of Control) or Change in Leadership or immediately prior to the termination of employment, whichever annual rate is higher.

(c) "Board" means Board of Directors of the Company.

(d) "Bonus Pay" means, with respect to a Participant, the total target payments with respect to the Participant under the Company's cash bonus and other cash incentive programs at 100% of plan (i) for the Company fiscal year in which the Change of Control occurs (or for the immediately preceding year if the target payment with respect to the Participant for the Company fiscal year in which the Change of Control occurs has not yet been established) (without regard to any reduction made in the target payments In Anticipation of a Change of Control), (ii) for the Company fiscal year in which the Change in Leadership occurs (or for the immediately preceding year if the target payment with respect to the Participant for the Company fiscal year in which the Change in Leadership occurs has not yet been established), or (iii) for the Company fiscal year in which the Participant's employment terminates, whichever total target payment is highest.

(e) "Change in Leadership" means John Ambroseo ceasing to be Chief Executive Officer of the Company.

(f) "Change in Leadership Good Reason" means any one or more of the following:

(i) The Employer reduces the Participant's Base Pay.

(ii) Without the Participant's express written consent, the Employer requires the Participant to change the location of his or her job or office, so that he or she will be based at a location more than fifty (50) miles from the location of his or her job or office immediately prior to the Change in Leadership.

(iii) The Participant's target cash incentive opportunity as a percentage of Base Pay is reduced.

(iv) The Participant incurs a reduction in title.

(vi) The Company or any successor company breaches any of the provisions of this Plan.

Provided, however, that such events shall not constitute grounds for a Change in Leadership Good Reason termination unless the Participant has provided notice to the Company of the existence of the one or more of the above conditions within 90 days of Participant's knowledge of its initial existence and the Company has been provided at least 30 days to remedy the condition.

(g) "Change in Leadership Just Cause" means the termination of employment of a Participant shall have taken place as a result of (i) refusal or failure to substantially perform (other than incapacity due to physical or mental illness) Participant's duties; provided that if curable, the failure to substantially perform will constitute "Change in Leadership Just Cause" only if such failure continues after the Board has provided Participant with a written demand for substantial performance setting forth in detail the specific respects in which it believes Participant has not substantially performed Participant's duties and has provided Participant a reasonable opportunity to cure the same; (ii) Participant's refusal or failure to adhere to any Company policy or follow any lawful directive of the Board or the Chief Executive Officer; provided that if curable, the failure will constitute "Change in Leadership Just Cause" only if such failure continues after the Board has provided the Executive with a written demand for adherence to such policy or following of the directive and Executive has been provided a reasonable opportunity to cure the same; (iii) Participant discriminates or harasses, as determined in good faith by the Board after a formal investigation by an outside investigator (which must include a good faith discussion with the Participant), another employee or contractor of the Company or any of its affiliates on the basis of gender, race, color, creed, religion, sexual orientation, marital status, veteran status, or any other category protected by applicable law; (iv) Participant's breach of a fiduciary duty owed to the Company or any of its affiliates; (v) Participant's commission of a felony; (vi) Participant's misappropriation (or attempted misappropriation) of any of the funds, information, or property of the Company or any of its affiliates; (vii) Participant's commission of any other act or willful omission involving theft, moral turpitude, misappropriation, embezzlement, fraud or dishonesty; or (viii) other misconduct or gross negligence by Participant that has caused or is likely to cause, as determined in good faith by the Board, a materially adverse impact, monetary, reputational or otherwise, to the Company or on Participant's ability to effectively perform Participant's duties with the Company or any affiliate.

(h) "Change in Leadership Severance Benefits" means the aggregate of the Change in Leadership Severance Payments and the benefits under Section 4.5(b) hereof.

(i) "Change in Leadership Severance Payment" means the payment of severance compensation as provided in Section 4.3(b).

(j) "Change of Control" means a (i) change in ownership of the Company, (ii) change in effective control of the Company, or (iii) change in the ownership of a substantial portion of the Company's assets (with an asset value change in ownership exceeding more than 50% of the total gross fair market value replacing the 40% default rule), all as defined under Code Section 409A and the final Treasury Regulations thereunder.

(k) "Change of Control Good Reason" means any one or more of the following:

(i) The Employer reduces the Participant's Base Pay.

(ii) Without the Participant's express written consent, the Employer requires the Participant to change the location of his or her job or office, so that he or she will be based at a location more than twenty-five (25) miles from the location of his or her job or office immediately prior to the Change of Control.

(iii) The Participant's cash and equity incentive opportunities, taken as a whole, are materially reduced.

(iv) The Participant incurs a significant reduction in duties, responsibilities or authority as determined by the Review Committee.

(v) A successor company fails or refuses to assume the Company's obligations under this Plan, as required by Article VII.

(vi) The Company or any successor company breaches any of the provisions of this Plan.

Provided, however, that such events shall not constitute grounds for a Change of Control Good Reason termination unless the Participant has provided notice to the Company of the existence of the one or more of the above conditions within 90 days of Participant's knowledge of its initial existence and the Company has been provided at least 30 days to remedy the condition.

(l) "Change of Control Just Cause" means the termination of employment of an Employee shall have taken place as a result of (i) an act or acts of dishonesty undertaken by such Employee and intended to result in substantial gain or personal enrichment of the Employee at the expense of his or her Employer, (ii) persistent failure or inability to perform the duties and obligations of such Employee's employment which are demonstrably willful and deliberate on the Employee's part and which are not remedied in a reasonable period of time after receipt of written notice from the Company, or (iii) Employee's conviction of, or plea of nolo contendere to, a felony.

(m) "Change of Control Severance Benefits" means the aggregate of the Change of Control Severance Payments and the benefits under Section 4.5(a) hereof.

(n) "Change of Control Severance Payment" means the payment of severance compensation as provided in Section 4.3(a).

(o) "Code" means the Internal Revenue Code of 1986, as amended.

(p) "Company" means Coherent, Inc., a Delaware corporation, and any successor as provided in Article VII hereof.

(q) "Employee" means a common law employee of an Employer (other than an employee who is a party to an individual agreement with the Company which provides severance or severance-type benefits), whose customary employment as of a Change of Control or a Change in Leadership, as applicable, is 20 hours or more per week. For purposes of this Plan, an Employee shall be considered to continue to be employed in the case of sick leave, military leave, or any other leave of absence approved by the Company.

(r) "Employer" means the Company or a subsidiary of the Company which has adopted the Plan pursuant to Article VI hereof.

(s) "ERISA" means the Employee Retirement Income Security Act of 1974, as amended.

(t) "Executive Officer" means an individual determined by the Board to be an executive officer of the Company subject to the reporting requirements of Section 16 of the Securities Exchange Act of 1934, as amended.

(u) "In Anticipation of a Change of Control" means in anticipation of a Change of Control provided a Change of Control occurs within two months after the action.

(v) "Non-Executive Officer Vice-President" means a Vice-President of the Company who is not an Executive Officer.

(w) "Participant" means an Employee who meets the eligibility requirements of Section III.

(x) "Payment Date" means the date which occurs sixty (60) days following any Participant's separation from service (as that term is defined in Section 409A of the Code); provided, however, if the Release becomes effective and irrevocable prior to sixty (60) days following the Participant's separation from service, the Payment Date means the second business day after the Release becomes effective and irrevocable unless the sixty (60) day period following the Participant's separation from service spans two calendar years in which event the Payment Date means the later of (i) the second business day after the Release becomes effective and irrevocable and (ii) the second business day of the second calendar year in such sixty (60) day period.

(y) "Plan" means the Coherent, Inc. Change of Control and Leadership Change Severance Plan, as amended and restated as of the Amendment Effective Date.

(z) "Review Committee" means a committee established by the Board, the primary functions of which shall be to determine whether Participants have incurred a significant reduction in duties, responsibilities or authority, and to establish, where necessary, the date of a Participant's termination of employment for purposes of the Plan. The Review Committee shall be composed solely of members of the Board serving as such immediately prior to a Change of Control. The Review Committee shall establish such procedures as it deems appropriate to facilitate a fair and objective review process to determine whether a Participant has incurred a significant reduction in his or her duties and responsibilities

(aa) "Severance Benefits" means the aggregate of the applicable Severance Payments and the applicable benefits under Section 4.5 hereof.

(bb) "Severance Payment" means the payment of severance compensation as provided in Section 4.3 hereof.

(cc) "Special Cash Payment" means a monthly cash amount equal to $2,750 to be paid to Participant in lieu of monthly Company-subsidized COBRA, life insurance plan premiums and/or any other welfare benefits as provided in Section 4.5(a)(ii) or Section 4.5(b)(ii).

2.2 Applicable Law. To the extent not preempted by the laws of the United States, the laws of the State of California (without regard to the choice of law rules) shall be the controlling law in all matters relating to the Plan.

2.3 Severability. If a provision of this Plan shall be held illegal or invalid, the illegality or invalidity shall not affect the remaining parts of the Plan and the Plan shall be construed and enforced as if the illegal or invalid provision had not been included.

## ARTICLE III

## ELIGIBILITY

3.1 Participation in Plan. As of the Amendment Effective Date, the Compensation and H.R. Committee of the Board has reaffirmed the Participants in the Plan as of the Amendment Effective Date. Following the Amendment Effective Date, new Executive Officers of the Company shall automatically become Participants in the Plan with respect to Change in Control Severance Benefits but shall only become Participants in the Plan with respect to Change in Leadership Severance Benefits if the Compensation and H.R. Committee of the Board, in its sole discretion, affirmatively determines that they are eligible Participants; provided, however, that new Non-Executive Officer Vice-Presidents shall only become Participants in the Plan if the Compensation and H.R. Committee of the Board, in its sole discretion, affirmatively determines that they are eligible Participants. A Participant shall cease to be a Participant in the Plan when he or she ceases to be an Employee of an Employer, unless such Participant is then entitled to payment of Severance Benefits as provided in the Plan. A Participant entitled to Severance Benefits shall remain a Participant in the Plan until the full amount of the Severance Payment and other Severance Benefits have been paid to the Participant.

## ARTICLE IV

## SEVERANCE BENEFITS

4.1 Right to Severance Payment. A Participant shall, subject to the Participant's entering into and not revoking a Release of Claims by the Payment Date in favor of the Company or any successor company in substantially the form attached hereto as Exhibit A (the "Release"), be entitled to receive from the Company a Change of Control Severance Payment in the amount provided in Section 4.3(a) if there has been a Change of Control of the Company and if, on (or In Anticipation of a Change of Control) or within two (2) years after the Change of Control, the Participant's employment by an Employer shall terminate by the Employer other than for Change of Control Just Cause or by the Employee for Change of Control Good Reason. A Participant shall, subject to the Participant's entering into and not revoking a Release, be entitled to receive from the Company a Change in Leadership Severance Payment in the amount provided in Section 4.3(b) if there has been a Change in Leadership and if, on or within two (2) years after the Change in Leadership, the Participant's employment by an Employer shall terminate by the Employer other than for Change in Leadership Just Cause or by the Employee for Change in Leadership Good Reason. A Participant shall not be entitled to a Severance Payment if termination occurs for reasons not specified in Section 4.2, including (but not limited to) death, voluntary termination other than for applicable Good Reason, total and permanent disability, or for applicable Just Cause.

4.2 Termination of Employment. A Participant shall be entitled to a Change of Control Severance Payment and to the benefits described in Section 4.5(a) if his or her employment by an Employer is terminated, during the time frame and subject to the Release requirement set forth in Section 4.1, by the Employee for Change of Control Good Reason or by the Employer for other than Change of Control Just Cause, death or total and permanent disability. A Participant shall be entitled to a Change in Leadership Severance Payment and to the benefits described in Section 4.5(b) if his or her employment by an Employer is terminated, during the time frame and subject to the Release requirement set forth in Section 4.1, by the Employee for Change in Leadership Good Reason or by the Employer for other than Change in Leadership Just Cause, death or total and permanent disability. A Participant who would otherwise be eligible for both a Change of Control Severance Payment as well as a Change in Leadership Severance Payment shall only be eligible for a Change of Control Severance Payment and shall not receive a Change in Leadership Severance Payment in addition to the Change of Control Severance Payment.

4.3 Amount of Severance Payment.

(a) Change of Control. Each Participant entitled to a Change of Control Severance Payment under this Plan shall receive from the Company a cash payment as follows:

(i) Chief Executive Officer. The Change of Control Severance Payment for the Company's Chief Executive Officer shall equal the product of 2.99 times the sum of the Chief Executive Officer's Base Pay and Bonus Pay.

(ii) Executive Officer Vice-Presidents. The Change of Control Severance Payment for the Company's Executive Officer Vice-Presidents shall equal the product of two times the sum of the Executive Officer Vice-President's Base Pay and Bonus Pay.

(iii) Non-Executive Officer Vice-Presidents. The Change of Control Severance Payment for the Company's Non-Executive Officer Vice-Presidents shall equal the product of one times the sum of the Non-Executive Officer Vice-President's Base Pay and Bonus Pay.

(iv) Non-U.S. Participants. In the case of a Participant who performs all or substantially all of his or her employment services outside of the United States, the Company may, in its discretion, reduce the Severance Payment otherwise calculated under Section 4.3(a)(i), (ii) or (iii) by the amount of severance-type benefits to which such Participant is then entitled under the laws of the country or countries in which such services are performed.

(b) Change in Leadership. Each Executive Officer Vice-President and Non-Executive Officer Vice-Participant entitled to a Change in Leadership Severance Payment under this Plan shall receive from the Company a cash payment as follows:

(i) U.S. Participants. The Change in Leadership Severance Payment shall equal the product of one and one-half times the sum of the Participant's Base Pay and Bonus Pay.

(ii) Non-U.S. Participants. In the case of a Participant who performs all or substantially all of his or her employment services outside of the United States, the Company may, in its discretion, reduce the Severance Payment otherwise calculated under Section 4.3(b)(i) by the amount of severance-type benefits to which such Participant is then entitled under the laws of the country or countries in which such services are performed.

4.4 Time of Severance Payment. Subject to Section 4.5(a)(ii), 4.5(b)(ii), 4.5(b)(iii) and 4.5(e) hereof, the Severance Payment to which a Participant is entitled shall be paid by the Company to the Participant, in cash and in full, on the Payment Date. If such a Participant should die before all amounts payable to him or her have been paid, such unpaid amounts shall be paid in accordance with the Participant's will or by the laws of descent and distribution or to the personal representative of the Participant's estate.

4.5 Other Severance Provisions.

(a) Change of Control Severance. In the event a Change of Control Severance Payment obligation is triggered under this Plan for a Participant, such Participant shall also receive the following benefits:

(i) Equity Compensation Acceleration. Unless specifically provided otherwise by reference to this Plan in the equity award at the time of grant, one hundred percent of Participant's outstanding unvested equity compensation awards shall automatically accelerate their vesting so as to become fully vested and, with respect to stock options and stock appreciation rights, exercisable. Unless specifically provided otherwise by reference to this Plan in the performance-based restricted stock unit award at the time of grant, this accelerated vesting means 100% acceleration of shares subject to performance-based restricted stock units as to which the performance metrics have been truncated and measured as of the date of the Change of Control, such that they are converted into a fixed number of restricted stock units scheduled to vest based on the Participant's continued service, as with, for example, the performance-based restricted stock units granted to certain Participants in November, 2018.

(ii) Additional Cash Payments Calculated by Reference to Benefits Continuation. The Participant shall receive from the Company, beginning on the Payment Date, and in lieu of monthly Company-subsidized COBRA, life insurance plan premiums and/or any other welfare benefits, additional monthly cash payments in monthly amounts equal to the Special Cash Payment; provided, however that such additional monthly cash payments shall be delayed six months and one day from the date of termination (and then paid in one first installment equal to delayed amounts) to the extent required to avoid the imposition of additional tax under Code Section 409A and the final regulations and any guidance promulgated thereunder ("Section 409A"). The Participant may, but is not obligated to, use such additional monthly cash payments toward the cost of COBRA and/or life insurance plan premiums. The Participant shall receive from the Company that number of monthly Special Cash Payments as specified below:

(A) Chief Executive Officer. The Company's Chief Executive Officer shall receive thirty-six (36) monthly Special Cash Payments.

(B) Officer Vice-Presidents. The Company's Executive Officer Vice-Presidents shall receive such twenty-four (24) monthly Special Cash Payments.

(C) Non-Officer Vice-Presidents. The Company's Non-Executive Officer Vice-Presidents shall twelve (12) monthly Special Cash Payments.

(b) Change in Leadership Severance. In the event a Change in Leadership Severance Payment obligation is triggered under this Plan for a Participant, such Participant shall also receive the following benefits:

(i) Equity Compensation Acceleration. Unless specifically provided otherwise by reference to this Plan in the equity award at the time of grant, the Participant's outstanding unvested time-vesting equity compensation awards which would have otherwise vested by continued employed for twenty-four (24) months after such termination of employment shall automatically accelerate their vesting so as to become fully vested and, with respect to stock options and stock appreciation rights, exercisable. Unless specifically provided otherwise by reference to this Plan in the performance-based restricted stock unit award at the time of grant, outstanding performance-based restricted stock units shall have their metrics measured at the designated time pursuant to the terms of the performance-based restricted stock unit award as though the Participant had continued in employment and the resulting number of performance-based restricted stock units that would have been earned if the Participant had continued in employment shall be prorated by multiplying the number of performance-based restricted stock units that would have been earned if the Participant had continued in employment by a fraction (not to exceed one (1)) with the numerator equal to the sum of the period of Participant's employment during the performance period of the performance-based restricted stock plus twenty-four (24) months and (2) the denominator equal to the performance period of the performance-based restricted stock units.

(ii) Additional Cash Payments Calculated by Reference to Benefits Continuation. The Participant shall receive from the Company, beginning on the Payment Date, and in lieu of monthly Company-subsidized COBRA, life insurance plan premiums and/or any other welfare benefits, additional monthly cash payments in monthly amounts equal to the Special Cash Payment; provided, however that such additional monthly cash payments shall be delayed six months and one day from the date of termination (and then paid in one first installment equal to delayed amounts) to the extent required to avoid the imposition of additional tax under Section 409A. The Participant may, but is not obligated to, use such additional monthly cash payments toward the cost of COBRA and/or life insurance plan premiums. The Participant shall receive from the Company eighteen (18) monthly Special Cash Payments.

(iii) Pro-rata Bonus. The Participant shall receive a pro rata portion (based on the number of days during the applicable performance year Participant was employed by the Company) of the annual bonus, if any, that would otherwise have been paid to Participant if Participant's employment had not so terminated, payable at the same time as such bonus is paid to other Company employees. The preceding sentence applies both with respect to the performance year during which the Participant's employment terminated as well as the immediately preceding performance year if the bonus for such immediately preceding performance year had not yet been paid, in which case the pro rata portion for such immediately preceding performance year would be 100% of the bonus for such immediately preceding performance year that would have been paid.

(c) Golden Parachute Excise Taxes.

(i) Best Results Approach for Participants. In the event that the severance and other benefits provided for in this Plan or otherwise payable or provided to a Participant (i) constitute "parachute payments" within the meaning of Section 280G of the Code, and (ii) but for this Section 4.5(c)(i), would be subject to the excise tax under Section 4999 of the Code (the "Excise Tax"), then the Participant's Plan benefits shall be either (a) delivered in full, or (b) delivered as to such lesser extent which would result in no portion of such severance and other benefits being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local income taxes and the Excise Tax, results in the receipt by the Participant on an after-tax basis, of the greatest amount of severance and other benefits, notwithstanding that all or some portion of such severance benefits may be taxable under Section 4999 of the Code.

(ii) General 280G. Unless the Company and Participant otherwise agree in writing, any determination required under this Section 4.5(c) will be made in writing to both the Company and Participant by a national "Big Four" accounting firm selected by the Company or such other person or entity to which the parties mutually agree (the "Accountants"). For purposes of making the calculations required by this Section 4.5(c), the Accountants, to the extent information is not available, may make reasonable assumptions and approximations concerning applicable taxes and may rely on reasonable, good faith interpretations concerning the application of Sections 280G and 4999 of the Code. The Company and the Participants shall furnish to the Accountants such information and documents as the Accountants may reasonably request in order to make a determination under this Section. The Company shall bear all costs the Accountants may reasonably incur in connection with any calculations contemplated by this Section 4.5(c)(ii). To the extent that any reduction in payments and/or benefits is required by this Section 4.5(c) and to the extent that an ordering of the reduction other than by the Participant is required by Section 409A or other tax requirements, the reduction shall occur in the following order: (1) reduction of cash payments; and (2) reduction of equity acceleration (full-value awards first, then stock options), and (3) other benefits paid to the Participant. In addition to the extent required by Section 409A or other tax requirements, (i) in the event that acceleration of vesting of equity awards is to be reduced, such acceleration of vesting shall be cancelled in the reverse order of the date of grant for any Participant's equity awards and (ii) in the event that some payments or benefits within a category are deferred compensation under Section 409A and some payments or benefits within a category are not deferred compensation under Section 409A, the payments or benefits that are not deferred compensation under Section 409A shall be reduced first. If ordering of reductions is not required by Section 409A or other tax requirements, the Participant shall determine the order of reduction.

(d) Section 409A.

(i) Notwithstanding anything to the contrary in this Plan, no severance pay or benefits to be paid or provided to any Participant, if any, pursuant to this Plan that, when considered together with any other severance payments or separation benefits, are considered deferred compensation under Section 409A (together, the "Deferred Payments") will be paid or otherwise provided until any Participant has a "separation from service" within the meaning of Section 409A. Similarly, no severance payable to any Participant, if any, pursuant to this Plan that otherwise would be exempt from Section 409A pursuant to Treasury Regulation Section 1.409A-1(b)(9) will be payable until any Participant has a "separation from service" within the meaning of Section 409A.

(ii) Any severance payments or benefits under this Plan that would be considered Deferred Payments will be paid on, or, in the case of installments, will not commence until, the Payment Date, or, if later, such time as required by Section 4.5(d)(iii). Except as required by Section 4.5(d)(iii), any installment payments that would have been made to any Participant during the period immediately following any Participant's separation from service and prior to the Payment Date but for the preceding sentence will be paid to the Participant on the Payment Date and the remaining payments shall be made as provided in this Plan.

(iii) Notwithstanding anything to the contrary in this Plan, if a Participant is a "specified employee" within the meaning of Section 409A at the time of such Participant's separation from service (other than due to death), then the Deferred Payments, if any, that are payable within the first six (6) months following such Participant's separation from service, will become payable on the first payroll date that occurs on or after the date six (6) months and one (1) day following the date of such Participant's separation from service. All subsequent Deferred Payments, if any, will be payable in accordance with the payment schedule applicable to each payment or benefit. Notwithstanding anything herein to the contrary, if a Participant dies following such Participant's separation from service, but prior to the six (6) month anniversary of the separation from service, then any payments delayed in accordance with this paragraph will be payable in a lump sum as soon as administratively practicable after the date of such Participant's death and all other Deferred Payments will be payable in accordance with the payment schedule applicable to each payment or benefit. Each payment, installment and benefit payable under this Plan is intended to constitute a separate payment for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations.

(iv) Any amount paid under this Plan that satisfies the requirements of the "short-term deferral" rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations will not constitute Deferred Payments for purposes of Section 4.5(d)(i).

(v) The foregoing provisions are intended to be exempt from or comply with the requirements of Section 409A so that none of the severance payments and benefits to be provided hereunder will be subject to the additional tax imposed under Section 409A, and any ambiguities or ambiguous terms herein will be interpreted to be exempt or so comply. The Company and Participant agree to work together in good faith to consider amendments to this Plan and to take such reasonable actions which are necessary, appropriate or desirable to avoid imposition of any additional tax or income recognition prior to actual payment to Participant under Section 409A. Notwithstanding the foregoing, the Company does not ensure that the Participant will not incur additional tax or income recognition because of Section 409A.

(e) Release of Claims. Notwithstanding any other provisions of this Plan, Participant's receipt of severance payments and benefits under this Plan is conditioned upon Participant signing and not revoking the Release and subject to the Release becoming effective prior to the Payment Date. If the Release does not become effective and irrevocable by the Payment Date, a Participant will forfeit any rights to severance or benefits under this Plan. In no event will severance payments or benefits be paid or provided until the Release becomes effective and irrevocable.

## ARTICLE V

## OTHER RIGHTS AND BENEFITS NOT AFFECTED

5.1 Other Benefits. Neither the provisions of this Plan nor the Severance Benefits provided for hereunder shall reduce any amounts otherwise payable, or in any way diminish the Participant's rights as an Employee of an Employer, whether existing now or hereafter, under any benefit, incentive, retirement, stock option, stock bonus, stock purchase plan, or any employment agreement or other plan or arrangement.

5.2 Employment Status. This Plan does not constitute a contract of employment or impose on the Participant or the Participant's Employer any obligation to retain the Participant as an Employee, to change the status of the Participant's employment, or to change the Company's policies regarding termination of employment.

5.3 Taxation of Plan Payments. All Severance Benefits paid pursuant to this Plan shall be subject to payroll and withholding taxes to the extent required by law.

## ARTICLE VI

## PARTICIPATING EMPLOYERS

6.1 Upon approval by the Board, this Plan may be adopted by any Subsidiary of the Company. Upon such adoption, the Subsidiary shall become an Employer hereunder and the provisions of the Plan shall be fully applicable to the Employees of that Subsidiary. The term "Subsidiary" means any corporation in which the Company, directly or indirectly, holds a majority of the voting power of its outstanding shares of capital stock.

## ARTICLE VII

## SUCCESSOR TO COMPANY

7.1 The Company shall require any successor or assignee, whether direct or indirect, by purchase, merger, consolidation or otherwise, to all or substantially all the business or assets of the Company, expressly and unconditionally to assume and agree to perform the Company's obligations under this Plan, in the same manner and to the same extent that the Company would be required to perform if no such succession or assignment had taken place. In such event, the term "Company," as used in this Plan, shall mean the Company as hereinbefore defined and any successor or assignee to the business or assets which by reason hereof becomes bound by the terms and provisions of this Plan.

## ARTICLE VIII

## DURATION, AMENDMENT AND TERMINATION

8.1 Duration. If a Change of Control has not occurred, the Change of Control Severance Benefits under this Plan shall expire at 11:59 pm PT on December 31, 2022, unless sooner terminated as provided in Section 8.2, or unless extended for an additional period or periods by resolution adopted by the Board at any time prior to the expiration of Change of Control Severance Benefits under this Plan.

If a Change of Control occurs, this Plan shall continue in full force and effect, and shall not terminate or expire until after all Participants who become entitled to Severance Benefits hereunder shall have received such payments in full.

The Change in Leadership Severance Benefits under this Plan shall expire at 11:59 pm PT on the second anniversary of the Change in Leadership with respect to any Participant whose employment has not terminated by such second anniversary of the Change in Leadership, unless extended for an additional period or periods by resolution adopted by the Board at any time prior to the expiration of the Change in Leadership Severance Benefits under this Plan.

8.2 Amendment and Termination. Unless a Change of Control has previously occurred or such amendment is In Anticipation of a Change of Control, the Change of Control Severance Benefits under this Plan may be amended in any respect by resolution adopted by a majority of the Board or may be amended by the Compensation and H.R. Committee of the Board in any respect that does not have a material adverse impact on any Participant or that is required by legal or other regulatory requirements regardless of whether the amendment may have a material adverse impact on a Participant. The Change of Control Severance Benefits under this Plan may be terminated by resolution adopted by a majority of the Board, provided that written notice is furnished to all Participants at least sixty (60) days prior to such termination and such termination is not In Anticipation of a Change of Control. If a Change of Control occurs, the Change of Control Severance Benefits under this Plan no longer shall be subject to amendment, change, substitution, deletion, revocation or termination in any respect whatsoever. The Change in Leadership Severance Benefits under this Plan may not be amended, changed, substituted, deleted, revoked or terminated in any respect whatsoever prior to the second anniversary of the Change in Leadership.

8.3 Form of Amendment. The form of any proper amendment or termination of the Plan or any benefits thereunder shall be a written instrument signed by a duly authorized officer or officers of the Company, certifying that the amendment or termination has been approved by the Board. A proper amendment of the Plan automatically shall effect a corresponding amendment to all Participants' rights hereunder. A proper termination of the Plan automatically shall effect a termination of all Participants' rights and benefits hereunder.

## ARTICLE IX

## LEGAL FEES AND EXPENSES

9.1 The Company shall pay all legal fees, costs of litigation, and other expenses incurred in good faith by each Participant as a result of the Company's refusal to pay the Severance Benefits to which the Participant becomes entitled under this Plan, or as a result of the Company's contesting the validity, enforceability or interpretation of the Plan, within 30 days of the invoice date for such expenses.

## ARTICLE X

## PLAN ADMINISTRATION

10.1 An employee or former employee of an Employer who disagrees with their allotment of benefits under this Plan may file a written appeal with the Company's Human Resources senior executive or other person designated by the Company.

(a) Any claim relating to this Plan shall be subject to this appeal process. If an employee or former employee of an Employer, or their representative (the "Claimant") submits a written claim for a benefit under the Plan and the claim is denied in whole or in part, the Employer shall provide the Claimant with a written or electronic notification that complies with Department of Labor Regulation Section 2520.104b-1(c)(1). The denial notice will include:

(i) specific reason(s) for the denial;

(ii) reference to the specific Plan provision(s) on which the denial is based;

(iii) a description of any additional material or information necessary for the Claimant to perfect the claim, and an explanation of why the material or information is necessary; and

(iv) an explanation of the Plan's claims review procedure and the time limits applicable to such procedures, including a statement of the Claimant's right to bring a civil action under ERISA Section 502(a) following a denial on review (as set forth in Section 10.1(e) below).

(b) The denial notice shall be furnished to the Claimant no later than ninety (90)-days after receipt of the claim by the Employer, unless the Employer determines that special circumstances require an extension of time for processing the claim. If the Employer determines that an extension of time for processing is required, then notice of the extension shall be furnished to the Claimant prior to the termination of the initial ninety (90)-day period. In no event shall such extension exceed a period of ninety (90)-days from the end of such initial period. The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the Plan expects to render the benefits determination.

(c) Claim Review Procedure. The Claimant may request review of the denial at any time within sixty (60) days following the date the Claimant received notice of the denial of his or her claim. The Employer shall afford the Claimant a full and fair review of the decision denying the claim and, if so requested, shall:

(i) provide the Claimant with the opportunity to submit written comments, documents, records and other information relating to the claim for benefits;

(ii) provide that the Claimant shall be provided, upon request and free of charge, reasonable access to, and copies of, all documents, records and other information (other than documents, records and other information that is legally-privileged) relevant to the Claimant's claim for benefits; and

(iii) provide for a review that takes into account all comments, documents, records and other information submitted by the Claimant relating to the claim, without regard to whether such information was submitted or considered in the initial benefit determination.

(d) If the claim is subsequently also denied by the Employer, in whole or in part, then the Claimant shall be furnished with a denial notice that shall contain the following:

(i) specific reason(s) for the denial;

(ii) reference to the specific Plan provision(s) on which the denial is based; and

(iii) an explanation of the Plan's claims review procedure (including (c)(ii) above) and the time limits applicable to such procedures, including a statement of the Claimant's right to bring a civil action under ERISA Section 502(a) following the denial on review.

(e) The decision on review shall be issued within sixty (60) days following receipt of the request for review. The period for decision may, however, be extended up to one hundred twenty (120) days after such receipt if the Employer determines that special circumstances require extension. In the case of an extension, notice of the extension shall be furnished to the Claimant prior to the expiration of the initial sixty (60)-day period. In no event shall such extension exceed a period of sixty (60) days from the end of such initial period. The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the Plan expects to render the benefits determination.

10.2 If the appeal of an employee or former employee of an Employer is denied, such employee or former employee shall have the right and option to elect (in lieu of litigation) to have any dispute or controversy arising under or in connection with the Plan settled by arbitration, conducted before a panel of three arbitrators sitting in a location selected by the employee within fifty (50) miles from the location of his or her job with an Employer, in accordance with rules of the American Arbitration Association then in effect. Judgment may be entered on the award of the arbitrator in any court having jurisdiction. All expenses of such arbitration, including the fees and expenses of the counsel for the employee, shall be borne by the Employer.

## ARTICLE XI

## ADMINISTRATIVE INFORMATION

11.1 The Plan sponsor and administrator is:

Coherent, Inc.
5100 Patrick Henry Drive
Santa Clara, CA 95054
(408) 764-4000

11.2 Designated agent for service of process:

General Counsel
Coherent, Inc.
5100 Patrick Henry Drive
Santa Clara, CA 95054
(408) 764-4000

11.3 Plan records are kept on a fiscal year basis.

11.4 The Plan shall be funded from the Employer's general assets only.

# EXHIBIT A

## COHERENT, INC.

## CHANGE OF CONTROL AND LEADERSHIP CHANGE SEVERANCE PLAN

## RELEASE OF CLAIMS

This Release of Claims ("Agreement") is made by and between Coherent, Inc. (the "Company"), and ("Employee").

WHEREAS, Employee has agreed to enter into a release of claims in favor of the Company in return for obtaining certain severance benefits specified in the Coherent, Inc. Change of Control and Leadership Change Severance Plan (the "Plan").

NOW THEREFORE, in consideration of the mutual promises made herein, the Parties hereby agree as follows:

1. Termination Date. Employee's employment terminated on , 20 .

2. Confidential Information. Employee shall continue to maintain the confidentiality of all confidential and proprietary information of the Company and shall continue to comply with the terms and conditions of the Employee Confidential Information and Arbitration Agreement[*] between Employee and the Company. Nothing in this Agreement nor any other agreement with the Company is intended to or will be used in any way to limit employees' rights to communicate with a government agency, as provided for, protected under or warranted by applicable law. Employee shall return all the Company property and confidential and proprietary information in his or her possession to the Company on the Effective Date (as defined below) of this Agreement.

3. Payment of Salary. Employee acknowledges and represents that the Company has paid all salary, wages, bonuses, accrued vacation, commissions and any and all other benefits due to Employee.

4. Release of Claims. Employee agrees that the payment to him or her of such foregoing severance benefits specified in the Plan represents consideration for settlement in full of all outstanding obligations owed to Employee by the Company. Employee, on behalf of himself or herself, and his or her respective heirs, family members, executors and assigns, hereby fully and forever releases the Company and its past, present and future officers, agents, directors, employees, investors, shareholders, administrators, affiliates, divisions, subsidiaries, parents, predecessor and successor corporations, and assigns, from, and agrees not to sue or otherwise institute or cause to be instituted any legal or administrative proceedings concerning any claim, duty, obligation or cause of action relating to any matters of any kind, whether presently known or unknown, suspected or unsuspected, that he or she may possess arising from any omissions, acts or facts that have occurred up until and including the Effective Date of this Agreement including, without limitation,

(a) any and all claims relating to or arising from Employee's employment relationship with the Company or its affiliates and the termination of that relationship;

[*]and similar or other agreements dealing with confidential information

(b) any and all claims relating to, or arising from, Employee's right to purchase, or actual purchase of shares of stock of the Company, including, without limitation, any claims for fraud, misrepresentation, breach of fiduciary duty, breach of duty under applicable state corporate law, and securities fraud under any state or federal law;

(c) any and all claims for wrongful discharge of employment; termination in violation of public policy; discrimination; breach of contract, both express and implied; breach of a covenant of good faith and fair dealing, both express and implied; promissory estoppel; negligent or intentional infliction of emotional distress; negligent or intentional misrepresentation; negligent or intentional interference with contract or prospective economic advantage; unfair business practices; defamation; libel; slander; negligence; personal injury; assault; battery; invasion of privacy; false imprisonment; and conversion;

(d) any and all claims for violation of any federal, state or municipal statute, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, the Age Discrimination in Employment Act of 1967, the Americans with Disabilities Act of 1990, the Fair Labor Standards Act, the Employee Retirement Income Security Act of 1974, The Worker Adjustment and Retraining Notification Act, the California Fair Employment and Housing Act, and Labor Code section 201, et seq. and section 970, et seq. and all amendments to each such Act as well as the regulations issued thereunder;

(e) any and all claims for violation of the federal, or any state, constitution;

(f) any and all claims arising out of any other laws and regulations relating to employment or employment discrimination; and

(g) any and all claims for attorneys' fees and costs.

Employee agrees that the release set forth in this section shall be and remain in effect in all respects as a complete general release as to the matters released. This release does not extend to (i) any obligations due Employee under the Plan; (ii) Employee's right to file a charge with, or participate in a charge by, the Equal Employment Opportunity Commission or comparable state agency against the Company (with the understanding that any such filing or participation does not give Employee the right to recover any monetary damages against the Company; Employee's release of claims herein bars Employee from recovering such monetary relief from the Company); (iii) claims under Division 3, Article 2 of the California Labor Code (which includes California Labor Code section 2802 regarding indemnity for necessary expenditures or losses by Employee); (iv) claims prohibited from release as set forth in California Labor Code section 206.5 (specifically "any claim or right on account of wages due, or to become due, or made as an advance on wages to be earned, unless payment of such wages has been made"); and (v) Employee's rights to coverage under any fiduciary insurance policy purchased or obtained by or on behalf of the Company in which Employee is insured or in connection with the Company's Change in Control (as defined in the Plan) or to indemnification under any contract, by-law or other arrangement that would cover Employee but for this Release.

5. **[40 or Over Employees Only]** <u>Acknowledgment of Waiver of Claims under ADEA</u>. Employee acknowledges that he or she is waiving and releasing any rights he or she may have under the Age Discrimination in Employment Act of 1967 ("<u>ADEA</u>") and that this waiver and release is knowing and voluntary. Employee and the Company agree that this waiver and release does not apply to any rights or claims that may arise under the ADEA after the Effective Date of this Agreement. Employee

acknowledges that the consideration given for this waiver and release Agreement is in addition to anything of value to which Employee was already entitled. Employee further acknowledges that he has been advised by this writing that (a) he or she should consult with an attorney prior to executing this Agreement; (b) he or she has at least twenty-one (21) days within which to consider this Agreement; (c) he or she has seven (7) days following the execution of this Agreement by the parties to revoke the Agreement; (d) this Agreement shall not be effective until the revocation period has expired without revocation; and (e) nothing in this Agreement prevents or precludes Employee from challenging or seeking a determination in good faith of the validity of this waiver under the ADEA, nor does it impose any condition precedent, penalties or costs for doing so, unless specifically authorized by federal law. Any revocation should be in writing and delivered to the Vice-President of Human Resources at the Company by close of business on the seventh day from the date that Employee signs this Agreement.

6. Civil Code Section 1542. Employee represents that he or she is not aware of any claims against the Company other than the claims that are released by this Agreement. Nevertheless, Employee intends this release to be a general release, and to all claims he or she may have, whether known or unknown. Employee acknowledges that he has been advised by legal counsel and is familiar with the provisions of California Civil Code 1542, below, which provides as follows:

> **A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, AND THAT IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASING PARTY.**

Employee, being aware of said code section and in furtherance of his or her release of all claims, known and unknown, agrees to expressly waive any rights he or she may have thereunder, as well as under any statute or common law principles of similar effect.

7. No Pending or Future Lawsuits. Employee represents that he or she has no lawsuits, claims, or actions pending in his or her name, or on behalf of any other person or entity, against the Company or any other person or entity referred to herein. Employee also represents that he or she does not intend to bring any claims on his or her own behalf or on behalf of any other person or entity against the Company or any other person or entity referred to herein.

8. Application for Employment. Employee understands and agrees that, as a condition of this Agreement, he or she shall not be entitled to any employment with the Company, its subsidiaries, or any successor, and he or she hereby waives any right, or alleged right, of employment or re-employment with the Company.

9. No Cooperation. Employee agrees that he or she will not counsel or assist any attorneys or their clients in the presentation or prosecution of any disputes, differences, grievances, claims, charges, or complaints by any third party against the Company or its affiliates and/or any officer, director, employee, agent, representative, shareholder or attorney of the Company or its affiliates, unless under a subpoena or other court order to do so or when required to do so in response to an investigation conducted by an administrative agency of competent jurisdiction.

10. Costs. The Parties shall each bear their own costs, expert fees, attorneys' fees and other fees incurred in connection with this Agreement.

11. Authority. Employee represents and warrants that he has the capacity to act on his own behalf and on behalf of all who might claim through him to bind them to the terms and conditions of this Agreement.

12. No Representations. Employee represents that he has had the opportunity to consult with an attorney, and has carefully read and understands the scope and effect of the provisions of this Agreement. Neither party has relied upon any representations or statements made by the other party hereto which are not specifically set forth in this Agreement.

13. Severability. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement shall continue in full force and effect without said provision.

14. Entire Agreement. This Agreement, along with the Plan and the Employee Confidential Information and Arbitration Agreement,* represents the entire agreement and understanding between the Company and Employee concerning Employee's separation from the Company.

15. No Oral Modification. This Agreement may only be amended in writing signed by Employee and the CEO [CFO for the Agreement with the CEO] of the Company.

16. Governing Law. This Agreement shall be governed by the internal substantive laws, but not the choice of law rules, of the State of California.

17. Effective Date. [**40 or Over Employees Only** — otherwise effective upon signing by both parties] This Agreement is effective eight (8) days after it has been signed by both Parties, and provided that Employee shall have not revoked this Agreement under paragraph 5. Such eighth day shall be deemed the "Effective Date" of this Agreement.

18. Counterparts. This Agreement may be executed in counterparts, and each counterpart shall have the same force and effect as an original and shall constitute an effective, binding agreement on the part of each of the undersigned.

19. Voluntary Execution of Agreement. This Agreement is executed voluntarily and without any duress or undue influence on the part or behalf of the Parties hereto, with the full intent of releasing all claims. The Parties acknowledge that:

(a) They have read this Agreement;

(b) They have been represented in the preparation, negotiation, and execution of this Agreement by legal counsel of their own choice or that they have voluntarily declined to seek such counsel;

(c) Understand the terms and consequences of this Agreement and of the releases it contains;

(d) They are fully aware of the legal and binding effect of this Agreement.

IN WITNESS WHEREOF, the Parties have executed this Agreement on the respective dates set forth below.

**Coherent, Inc.**

Dated: __________, 20

By ________________________________________

Dated: __________, 20

________________________________________

Exhibit 10.2

# CEO TRANSITION AND RETIREMENT AGREEMENT

THIS CEO TRANSITION AND RETIREMENT AGREEMENT ("Agreement") is entered into as of April 13, 2019 ("Execution Date") by John R. Ambroseo ("Executive") and Coherent, Inc. for and on behalf of itself and its predecessors, successors, assigns, parents, subsidiaries, branches, affiliated entities and related entities (collectively, "Company"). Executive and Company are collectively referred to in this Agreement as the "Parties."

WHEREAS, Executive has been employed by the Company for more than thirty years and Executive and the Company would like to provide for an effective transition of the Chief Executive Officer role in connection with Executive's retirement as of December 1, 2021 (the "Retirement Date");

WHEREAS, the Board of Directors of Coherent, Inc. ("Board") will commence a search process to identify a successor Chief Executive Officer;

WHEREAS, Executive shall transition to the role of Special Advisor from the role of Chief Executive Officer as of the earlier of (i) the transition date communicated by the Board in writing in advance to the Executive in connection with the commencement of a successor to serve as Chief Executive Officer of the Company and (ii) the second anniversary of the Execution Date (such earlier date, "Transition Date");

WHEREAS, the Company wishes to set forth the terms of Executive's role with the Company during the period from the Execution Date through the Retirement Date in exchange for the agreements expressed herein;

WHEREAS, this Agreement sets forth the terms and conditions of Executive's role with the Company during the period from the Execution Date through the Retirement Date and any continuing obligations of the Parties to one another following the end of the employment relationship;

WHEREAS, each of the undersigned Parties to this Agreement has had ample opportunity to review the facts and law relevant to this issue, has consulted fully and freely with competent counsel of its choice if desired, and has entered this Agreement knowingly and intelligently without duress or coercion from any source and Executive has had a reasonable time in which to consider whether to sign this Agreement.

NOW, THEREFORE, in consideration of the foregoing recitals and the mutual promises contained below, it is agreed as follows:

1. Title and Provision of Services. From the Execution Date through immediately before the Transition Date, Executive shall continue to serve as Chief Executive Officer and President of the Company with the duties, responsibilities and authority consistent with those Executive had immediately prior to the Execution Date. From the Transition Date through the Retirement Date, Executive shall serve as a Special Advisor, with such duties and obligations as may be mutually agreed upon between Executive and the Board. From the Execution Date through the Retirement Date, Executive shall perform such succession planning, strategic and other services reasonably requested by the Board. Executive agrees to fully cooperate with the orderly transfer of his responsibilities as the Company may direct, including, without limitation, after the Retirement Date: (i) assisting in the transition of his duties to a new Chief Executive Officer for a period not to exceed one hundred eighty (180) days after the Retirement Date; (ii) complying with any reasonable Company request for information after the Retirement Date; (iii) making himself reasonably available in connection with any and all claims, disputes, negotiations, investigations, and lawsuits or administrative proceedings involving the Company or its affiliates; and (iv) providing thorough and accurate information or documents, providing truthful declarations or statements to the Company or its affiliates, meeting with attorneys or other representatives of the Company or its affiliates, preparing for and giving thorough and truthful testimony, and/or otherwise cooperating in the investigation, defense or prosecution of proceedings involving the Company.

2. Payments by the Company. In consideration for (i) Executive's execution, without revocation, and compliance with this Agreement, including the release of claims below, (ii) Executive's execution of the General Release of Claims attached hereto as Exhibit A ("Release") no earlier than the day following the Retirement Date, (iii) Executive not revoking the Release prior to the eighth day following such execution and (iv) Executive providing the services set forth in paragraph 1 and provided that the Company does not terminate Executive's employment for Cause, the following compensation will be provided to Executive: (i) base salary at a rate no less than Executive's base salary in effect on the Execution Date for the period from the Execution Date through the second anniversary of the Execution Date and $10,000 per month thereafter through the Retirement Date; (ii) continued vesting in Executive's outstanding equity awards under the Company's 2011 Equity Incentive Plan according to their terms during the period from the Execution Date through the Retirement Date; (iii) eligibility for a restricted stock unit grant under the Company's 2011 Equity Incentive Plan as determined by the Board (or a designated committee thereof) after consultation with Executive, with any such equity award to be granted at the time that equity awards are made to other executives of the Company in the fall of 2019 but only if the Transition Date has not occurred by such date and provided that the vesting schedule for any such restricted stock unit grant shall be such that the award shall be 100% vested no later than the Retirement Date provided Executive's service under this Agreement continues through the Retirement Date (such base salary, continued vesting and eligibility for 2019 equity award,

collectively, "Benefits"); and (iv) continued participation until the second anniversary of the Execution Date in the Company's Variable Compensation Plan and benefit programs to the extent provided and consistent with their terms. If Executive dies prior to the Retirement Date, Executive's equity awards under the 2011 Equity Incentive Plan outstanding as of Executive's death shall vest with all outstanding time-based equity awards vesting as of Executive's death and being delivered as soon as practicable after Executive's death and the number of outstanding performance-based equity awards that vest based on performance being determined after the end of the performance period in the same manner as for other executives of the Company and delivered at approximately the same time as for other executives of the Company. Executive acknowledges and understands that amounts payable pursuant to this Agreement will be reduced by any and all applicable federal, state, or local payroll tax withholding or other authorized deductions permitted by applicable law. Executive also acknowledges and understands that this Agreement provides no other rights to compensation or benefits for the period from the Execution Date through the Retirement Date other than as set forth in this paragraph and paragraph 3 of this Agreement. Executive acknowledges that the Benefits provided to Executive as set forth above and the Change of Control Benefits (as defined in paragraph 3 below) are greater than the sum to which Executive is otherwise entitled to receive without executing this Agreement, and Executive agrees that these Benefits and the Change of Control Benefits are in excess of those to which Executive is otherwise entitled without a release of claims under the Company's policies and procedures, or under any law, agreement or plan, written, oral or implied.

3. Change of Control. If a Change of Control (as defined in the Company's Change of Control Severance Plan effective December 6, 2018 ("Change of Control Severance Plan")) ("Change of Control") occurs prior to the Retirement Date, then the Company may terminate Executive's employment or the Executive may terminate his employment pursuant to this paragraph. If the Company terminates Executive's employment prior to the Retirement Date on (or In Anticipation of a Change of Control (as defined in the Change of Control Severance Plan)), or after a Change of Control without Just Cause (as defined in the Change of Control Severance Plan) or if the Executive terminates his employment prior to the Retirement Date on or after a Change of Control for Good Reason (as defined in the Change of Control Severance Plan based upon Executive's duties, responsibilities and authority as Chief Executive Officer on the Execution Date and without regard to the time limitations for notice such that if Executive is not Chief Executive Officer he will have Good Reason), then Executive shall be entitled to the payments he would have received under the Change of Control Severance Plan upon such termination of employment in the same manner as if he were a CEO participant in such Change of Control Severance Plan including a Severance Payment in the amount set forth in Section 4.3(a) of the Change of Control Severance Plan, equity compensation acceleration as set forth in Section 4.5(a) of the Change of Control Severance Plan and Benefit Continuation Payments pursuant to Section 4.5(b) of the Change of

Control Severance Plan (collectively, "Change of Control Benefits"). If Executive's employment terminates prior to the Retirement Date due to Executive's death and a Change of Control occurs on or prior to the Retirement Date, then Executive's beneficiaries shall be entitled to the payments Executive would have received under the Change of Control Severance Plan upon a termination of Executive's employment in the same manner as if he were a CEO participant in such Change of Control Severance Plan on the date of the Change of Control and had his employment terminated on such date of the Change of Control including a Severance Payment in the amount set forth in Section 4.3(a) of the Change of Control Severance Plan, equity compensation acceleration as set forth in Section 4.5(a) of the Change of Control Severance Plan and Benefit Continuation Payments pursuant to Section 4.5(b) of the Change of Control Severance Plan with base pay, bonus pay and equity determined as of the date immediately preceding Executive's death but in no event shall there be a duplicate payment, including without limitation, of equity. Neither Executive nor his beneficiaries shall be entitled to any further salary under this Agreement after termination of Executive's employment pursuant to this paragraph. If a Change of Control occurs and Executive continues to provide service pursuant to this Agreement through the Retirement Date, the Change of Control Benefits shall be paid to Executive in a lump sum on the Retirement Date.

4. Resignation from All Positions. Effective immediately prior to the Transition Date, Executive hereby resigns from any and all positions he holds with the Company including, without limitation, Chief Executive Officer, President and a director of the Board except for the position of Special Advisor, and will not thereafter represent himself as being an executive officer or director of the Company for any purpose. After the Retirement Date, Executive will not represent himself as being an executive officer, director, officer, attorney, agent or representative of the Company for any purpose.

5. Retirement Date and Certain Requirements. Executive's employment relationship with the Company will be terminated as of the Retirement Date, unless earlier terminated by the Company for Cause (as hereafter defined) or in connection with a Change of Control as set forth in paragraph 3. The period of Executive's employment relationship with the Company is herein referred to as the "Term". Executive understands and agrees that the terms contained in this Agreement are offered by the Company contingent upon Executive's fulfillment of his obligations under this Agreement including, without limitation, unless otherwise determined by the Board, serving as Chief Executive Officer and President until the Transition Date and as a Special Advisor from the Transition Date through the earlier of the Retirement Date or the termination of employment pursuant to paragraph 3 and cooperation in an orderly transition of Executive's duties and execution and nonrevocation of the release contained within this Agreement and the execution and nonrevocation of the Release. For purposes of this Agreement, "Cause" means (i)(A) refusal or failure to substantially perform (other than incapacity due to physical or mental illness) Executive's

duties as defined in paragraph 1 or breach of the provisions of this Agreement; provided that if curable, the failure to substantially perform or breach of the provisions of this Agreement will constitute "Cause" only if such failure or breach continues after the Board has provided Executive with a written demand for substantial performance setting forth in detail the specific respects in which it believes Executive has not substantially performed Executive's duties or breached the Agreement and has provided Executive a reasonable opportunity to cure the same; (B) Executive's refusal or failure to adhere to any policy of the Company or follow any lawful directive of the Board or the Chief Executive Officer provided that if curable, the failure will constitute "Cause" only if such failure continues after the Board has provided the Executive with a written demand for adherence to such policy or following of the directive and Executive has been provided a reasonable opportunity to cure the same; or (C) Executive discriminates or harasses, as determined in good faith by the Board after a formal investigation by an outside investigator (which must include a good faith discussion with the Executive), another employee or contractor of the Company or any of its affiliates on the basis of gender, race, color, creed, religion, sexual orientation, marital status, veteran status, or any other category protected by applicable law; (ii) Executive's breach of a fiduciary duty owed to the Company or any of its affiliates; (iii)(A) Executive's commission of a felony; (B) Executive's misappropriation (or attempted misappropriation) of any of the funds, information, or property of the Company or any of its affiliates; or (C) Executive's commission of any other act or willful omission involving theft, moral turpitude, misappropriation, embezzlement, fraud or dishonesty; or (iv) other misconduct or gross negligence by Executive that has caused or is likely to cause, as determined in good faith by the Board, a materially adverse impact, monetary, reputational or otherwise, to the Company or on Executive's ability to effectively perform Executive's duties with the Company or any affiliate.

6. Valid Consideration. Executive and Company agree that the Benefits described in paragraph 2 and the Change of Control Benefits described in paragraph 3 are each in excess of those required by the Company's policies or procedures or by any pre-existing contractual obligation of the Company or by any statute, regulation or ordinance, and such excess amounts are offered by the Company solely as consideration for this Agreement. In the event Executive fails to abide by the terms of this Agreement, the Company may elect, at its option and without waiver of other rights or remedies it may have, not to pay or provide any excess Benefits, and if in breach of paragraph 7 to seek to recover previously paid excess Benefits or Change of Control Benefits.

7. Noncompetition and Reaffirmation of Restrictive Agreements. Executive acknowledges the goodwill the Company has built up in conjunction with its business operations, at significant time and expense to the Company. Employee therefore agrees that, during the Term, unless agreed to in writing by the Board or the Chief Executive Officer of the Company, Employee will not, directly or indirectly, whether through his own business, or as an employee, salesman,

consultant, independent contractor, officer or director, or otherwise, for any person or entity, aid or assist in any manner, any person or entity that engages in a business which is which is competitive with the current or reasonably anticipated business of the Company, including, without limitation, the laser industry or the photonics industry; provided, however, Employee may own, directly or indirectly, solely as an investment, securities of any company which is registered on any national securities exchange or actively traded in a generally recognized over the counter market so long as Employee owns less than two percent (2%) of the outstanding securities of such company. Executive expressly reaffirms and incorporates as part of this Agreement any and all confidentiality, intellectual property and non-solicitation provisions of any agreement with the Company.

8. Waiver and Release. To the extent permitted by applicable law, in exchange for the consideration provided in this Agreement, Executive, for himself and his heirs, executors, representatives, agents, insurers, administrators, successors and assigns (collectively, "Releasors") irrevocably and unconditionally fully and forever waives, releases and discharges the Company and each and all of its present and former officers, agents, directors, managers, employees, representatives, affiliates, shareholders, attorneys, members, and each of their successors and assigns, and all persons acting by, through, under or in concert with, and individually in their official capacities (collectively, "Releasees") from any and all claims, demands, actions, causes of action, obligations, judgments, rights, fees, damages, liabilities and expenses (inclusive of attorneys' fees) of any kind whatsoever, whether known or unknown (collectively, "Claim" or "Claims"), including, without limitation, any Claims under any federal, state, local or foreign law, that Releasors may have, have ever had or may in the future have arising out of, or in any way related to Executive's hire, benefits, employment, termination or separation from employment and any actual or alleged act, omission, transaction, practice, conduct, occurrence or other matter that existed or arose on or before the date of his execution of this Agreement, including, but not limited to any claims, under (as amended) the United States Constitution, Title VII of the Civil Rights Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, the Equal Pay Act, the Employee Retirement Income Security Act (with respect to unvested benefits), the Civil Rights Act of 1991, 42 U.S.C. section 1981, the Sarbanes-Oxley Act of 2002, the Worker Adjustment and Retraining Notification Act, the Family Medical Leave Act, the Rehabilitation Act, the Occupational Safety and Health Act, the Fair Labor Standards Act, the California Fair Employment and Housing Act, the California Family Rights Act, the California Business and Professions Codes, Civil Code, Labor Code, and Government Code, and/or any other federal, state or local law (statutory, regulatory or otherwise) that may be legally waived and released and any common law tort and/or contract claims, including, but not limited to, any claims of wrongful discharge, defamation, emotional distress, tortious interference with contract, invasion of privacy, nonphysical injury, personal injury or sickness or any other harm.

Nothing in this Agreement will be construed to (i) limit or affect Executive's right to challenge the validity of this release; (ii) in any way interfere with Executive's right and responsibility to give truthful testimony under oath; or (iii) prohibit Executive from participating in an investigation, filing a charge or otherwise communicating with any federal, state or local government office, official or agency, including, but not limited to, the Equal Employment Opportunity Commission, Department of Labor, National Labor Relations Board, or the Securities and Exchange Commission. However, Executive expressly promises never to seek or accept any compensatory damages, back pay, front pay, or reinstatement remedies with respect any Claim that Executive has released in this Agreement. Furthermore, this waiver and release of claims excludes, and Executive does not waive, release or discharge, any claims under state workers' compensation or unemployment laws Executive has against the Company and/or any claims by Executive that cannot be released by a private settlement agreement. In addition, nothing in this Agreement waives, releases or discharges (i) any claim regarding rights of indemnification and receipt of legal fees and expenses to which you are entitled under the Indemnification Agreement between the Company and Executive, the Company's or an affiliate of the Company's Certificate of Incorporation or By-laws (or similar instrument) or pursuant to applicable law or modifies, amends, or otherwise limits in any manner any rights Executive may have under the Indemnification Agreement or (ii) any of Executive's vested rights under the Coherent, Inc. 401(k) Retirement Plan, the Coherent, Inc. Deferred Compensation Plan or health benefit programs.

9. Unknown Claims. Executive agrees that his waiver and release of claims extends to all Claims of every nature and kind, known or unknown, suspected or unsuspected, past or present, arising from or attributable to Executive's employment or separation of employment with the Company. Executive therefore waives the protection of California Civil Code section 1542 or any analogous state law or federal law or regulation. Section 1542 reads as follows:

A general release does not extend to claims which the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her, would have materially affected his or her settlement with the debtor or released party.

10. Confidential Information and Non-Solicitation.

A. Executive understands and agrees that, by reason of his employment by the Company, Executive had access to confidential, proprietary and secret information, documents, materials and other information, in tangible and intangible form about the Company, its business, its customers and its methods of operation (collectively, "Confidential Information"), including but not limited to all trade secrets, confidential knowledge, data or other proprietary information relating to products, processes, know-how, designs, formulas, developmental or experimental work, computer programs, technology, products, product specifications, techniques, inventions, discoveries, improvements, research, test results, databases, other original works of authorship, customer lists or other information related to customers or prospective customers, marketing, sales and business plans, strategies, forecasts, budgets, projections, other financial information, cardholder information, or other information pertaining to any business of the Company or any of its employees, customers, clients, members, joint ventures, vendors, licensees, consultants or third parties with whom it does business. Executive understands that the above list is not exhaustive, and that Confidential Information also includes other information that is marked or otherwise identified as confidential or proprietary, or that would otherwise appear to a reasonable person to be confidential or proprietary in the context and circumstances in which the information is known or used.

Executive will treat all Confidential Information as strictly confidential and will not disclose or use any Confidential Information that Executive acquired, developed or created by reason of Executive's employment, except (i) if compelled by a valid subpoena or as otherwise required by law, but, in any such case, and to the extent permitted by law, only after providing the Company with prior written notice as soon as practicable and with reasonable opportunity to contest such subpoena or other requirement for information, (ii) for information that is or becomes publicly available other than through Executive's breach of any of Executive's obligations to the Company, (iii) pursuant to paragraph 14 below, or (iv) pursuant to 18 U.S.C. section 1833(b) described below.

B. Notwithstanding the nondisclosure obligations contained in paragraph 10.A. and paragraph 11, pursuant to 18 U.S.C. section 1833(b), Executive understands that he will not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that is made: (1) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney, and solely for the purpose of reporting or investigating a suspected violation of law; or (2) in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. Executive further understands that if he files a lawsuit for retaliation by the Company for reporting a suspected violation of law, Executive may disclose the Company's trade secret to an attorney and use the trade secret information in the court proceeding if Executive: (1) files any document containing the trade secret under seal; and (2) does not disclose the trade secret, except pursuant to court order. Executive understands that in the event it is determined that disclosure of Company trade secrets was not done in good faith as described in this paragraph 10.B, Executive may be subject to substantial damages, including punitive damages and attorneys' fees.

C. In addition, Executive will not, directly or indirectly, use Confidential Information to solicit, induce or influence any customer, supplier, lender, lessor or any other person having a business relationship with the Company to discontinue or reduce the extent of such relationship. For the Term and through the period ending on the twelve-month anniversary of the Retirement Date (the "Restricted Period"), Executive will not, without the prior written consent of the Board, disrupt, damage or interfere with the Company's business by directly or indirectly, recruiting, soliciting, or otherwise inducing or influencing any person who is employed by the Company in a managerial capacity in the management, design, production, operation, technology, sales or marketing areas of the Company or any person who is performing any of the above functions for the Company as an independent contractor to discontinue such employment or other relationship. Nothing set forth in this Agreement prohibits Executive from being employed by or engaged in a competing business without using the Company's Confidential Information.

D. Executive further understands and acknowledges that this Confidential Information and the Company's ability to reserve it for the exclusive knowledge and use of the Company is of great competitive importance and commercial value to the Company, and that improper use or disclosure of the Confidential Information by Executive might cause the Company to incur financial costs, loss of business advantage, liability under confidentiality agreements with third parties, civil damages and criminal penalties. Executive further agrees that a breach of this paragraph by him may give rise to an irreparable injury to the Company, which may not be adequately compensated by damages. Accordingly, in the event of a breach or threatened breach by Executive of this paragraph, the Company will be entitled to injunctive relief in addition to any damages to which it may be entitled and Executive expressly waives the requirement of any posting of a bond in such action.

11. Inventions. In exchange for receiving the benefits set forth in this Agreement, Executive hereby assigns to the Company, or its designee, all of Executive's right, title and interest throughout the world in and to any and all inventions, original works of authorship, designs, trademarks, formulae, processes, domain names, databases (and their contents), developments, concepts, know-how, improvements of trade secrets, whether or not patentable or registrable under patent, copyright, trademark or similar laws, ("Inventions") which Executive solely or jointly conceived or developed or reduced to practice, or caused to be conceived or developed or reduced to practice, during Executive's employment with the Company up through the Retirement Date. Executive acknowledges and agrees that Executive does not have any Inventions which were made by Executive prior to the commencement of Executive's employment with the Company. Upon request by the Company, Executive agrees to execute any and all applications, assignments or other instruments that the Company deems necessary to evidence the foregoing assignment or to apply for and obtain patents or trademark or copyright registrations in the United States or any foreign country or otherwise to protect the Company's interest in this Agreement (without additional compensation to Executive). Furthermore, Executive hereby appoints each of the Company's managers, acting severally, as Executive's attorney-in-fact to execute such documents on Executive's behalf. Executive understands that the provisions of this assignment of inventions to the Company are limited by Section 2870 of the California Labor Code, which states the following: 2870. (a) Any provision in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either: (1) Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or (2) Result from any work performed by the employee for the employer. (b) To the extent a provision in an employment agreement purports to require an employee to assign an invention otherwise excluded from being required to be assigned under subdivision (a), the provision is against the public policy of this state and is unenforceable.

12. Return of Property. Upon the Retirement Date, Executive will return to the Company all files, memoranda, records, credit cards, pagers, computers, computer files, passwords and pass keys, card keys, or related physical or electronic access devices, and any and all other property received from the Company or any of its current or former executives or generated by Executive in the course of employment; provided that Executive shall be allowed to retain his mobile number. Upon the Retirement Date, Executive will delete all electronic data and files pertaining to Executive's job or the Company's business operations, existing on Executive's personal computers, other personal electronic devices, and on any email account maintained or accessible by Executive. Without limitation on the foregoing, Executive will upon the Retirement Date return to the Company

all of the Company's property, including records, vendor/client lists, other lists, data, notes, reports, proposals, correspondence, specifications, drawings, blueprints, sketches, laboratory notebooks, flow charts, materials, equipment, other documents or property or other non-public information, or copies or reproductions of any of the aforementioned items, electronic devices (including, but not limited to, any laptop computer, blackberry or similar device, or cellphone), or other documents or property which, in each case, Executive obtained, received or produced in connection with his employment with the Company or that was within Executive's possession and control.

13. Non-Disparagement. Subject to paragraph 10.A. above and paragraph 14 below, and except to the extent Executive provides testimony under oath, Executive will not make any statements, whether orally or in writing, about the Company or any of its present or former officers, agents, directors, managers, employees, representatives, affiliates, shareholders, members, or any of their successors or assigns, or to engage in conduct which could reasonably be expected to adversely affect the reputation or business of the Company and/or any of its present or former officers, agents, directors, managers, employees, representatives, affiliates, shareholders, members, and each of their successors and assigns.

14. Permitted Communications. Executive acknowledges that nothing in this Agreement prohibits or restricts Executive from initiating communications directly with, responding to any inquiry from, or providing information to or testimony before, the Securities and Exchange Commission, Department of Justice, or any other governmental agency or self-regulatory organization, about actual or potential violations of laws or regulations. Executive further acknowledges that Executive is not required to obtain the Company's prior authorization before engaging in such communications, nor is Executive required to inform the Company about such communications.

15. No Admission. The Parties agree and acknowledge that this Agreement, and compliance with this Agreement, will not be construed as an admission by the Company of any liability whatsoever, or as an admission by the Company of any violation of the rights of Executive or any person, or violation of any order, law, statute, duty, or contract whatsoever against Executive or any person.

16. Assignment. This Agreement will be binding upon the Parties and upon their heirs, administrators, representatives, executors, successors, and assigns, and will inure to the benefit of said parties and each of them and to their heirs, administrators, representatives, executors, successors, and assigns. Executive expressly warrants that he has not transferred to any person or entity any rights, causes of action or claims released in this Agreement. Any purported assignment by Executive will be null and void.

17. Severability. Should any provision of this Agreement be held by a court of competent jurisdiction to be enforceable only if modified, or if any portion of this Agreement will be held as unenforceable and thus stricken, such holding will not affect the validity of the remainder of this Agreement, the balance of which will continue to be binding upon the Parties with any such modification to become a part of, and treated as though originally set forth in, this Agreement. The Parties further agree that any such court is expressly authorized to modify any such unenforceable provision of this Agreement in lieu of severing such unenforceable provision from this Agreement in its entirety, whether by rewriting the offending provision, deleting any or all of the offending provision, adding additional language to this Agreement or by making such other modifications as it deems warranted to carry out the intent and agreement of the Parties as embodied in this Agreement to the maximum extent permitted by law. However, if a court should hold that Executive's waiver and release of claims is void or voidable, in whole or in part, the Company at its election may recover the excess Benefits paid or provided under this Agreement.

18. Entire Agreement. This Agreement, including the Release, sets forth the entire agreement between the Parties and fully supersedes any and all prior agreements or understandings, written or oral, between the Parties pertaining to the subject matter of this Agreement (except that Executive will continue to be bound by the confidentiality, intellectual property and non-solicitation provisions of any agreement with the Company and/or any similar agreement previously executed by Executive will remain fully enforceable and binding on the Parties, all subject to paragraphs 10.A and 14 of this Agreement). Executive acknowledges and confirms that he will be entitled to the benefits of the Company's Change of Control Severance Plan only as set forth in paragraph 3 and that he will not be entitled to benefits of the Company's Change of Control Severance Plan with respect to any Change of Control occurring on or after Executive's Retirement Date. Executive represents and acknowledges that in executing this Agreement Executive did not rely and has not relied upon any representation or statement made by the Company or by any of the Company's agents, attorneys, or representatives with regard to the subject matter, basis or effect of this Agreement or otherwise, other than those specifically stated in this written Agreement. This Agreement may be modified only in a written document signed by the Parties and referring specifically to this Agreement.

19. Governing Law. This Agreement will be interpreted in accordance with the plain meaning of its terms and not strictly for or against any of the Parties. Except to the extent that federal law applies, this Agreement is entered into under California law and will be construed and governed under the laws of the State of California

20. Arbitration and Equitable Relief.

A. The Company and Executive agree that any dispute or controversy arising out of, in relation to, or in connection with this Agreement, or the making, interpretation, construction, performance or breach thereof, will be finally settled by binding arbitration in San Francisco, California under the then current rules of JAMS by one (1) arbitrator appointed in accordance with such rules. The arbitrator may grant injunctive or other relief in such dispute or controversy. The decision of the arbitrator, will be final, conclusive and binding on the parties to the arbitration. Judgment may be entered on the arbitrator's decision in any court of competent jurisdiction. The Parties agree that, any provision of applicable law notwithstanding, they will not request and the arbitrator will have no authority to award, punitive or exemplary damages against any party. Unless otherwise required by applicable law, the costs of the arbitration, including administrative and arbitrator's fees, will be shared equally by the parties. Each party will bear the cost of its own attorneys' fees and expert witness fees.

B. The parties may apply to any court of competent jurisdiction for a temporary restraining order, preliminary injunction, or other interim or conservatory relief, as necessary, without breach of this Agreement and without abridgment of the powers of the arbitrator.

C. EXECUTIVE HAS READ AND UNDERSTANDS THIS PARAGRAPH 20. EXECUTIVE UNDERSTANDS THAT BY SIGNING THIS AGREEMENT, EXECUTIVE WILL BE OBLIGATED TO SUBMIT ANY CLAIMS ARISING OUT OF, RELATING TO, OR IN CONNECTION WITH THIS AGREEMENT, OR THE INTERPRETATION, VALIDITY, CONSTRUCTION, PERFORMANCE, BREACH OR TERMINATION THEREOF, TO BINDING ARBITRATION, EXCEPT AS PROVIDED IN PARAGRAPH 20.B., AND THAT THIS ARBITRATION CLAUSE CONSTITUTES A WAIVER OF EXECUTIVE'S RIGHT TO A JURY TRIAL AND RELATES TO THE RESOLUTION OF ALL DISPUTES RELATING TO ALL ASPECTS OF THE RELATIONSHIP BETWEEN THE PARTIES.

21. Taxes. The Company and affiliates make no representations with regard to the effect on Executive's federal, state, or local income tax liability with regard to the Benefits or Change of Control Benefits and any other payments or benefits being provided to Executive. Executive hereby assumes full and sole responsibility for payment of taxes due, if any, on the consideration tendered herein and further agrees to defend, indemnify, and hold the Company and its affiliates harmless from and against any loss, liability, obligation, action, cause of action, claims, demands, or other

expenses of any nature whatsoever, relating to, in connection with, or arising out of the payment of said taxes and interest, and/or penalties imposed, arising out of any such tax.

22. Section 409A. The Company and Executive intend that this Agreement and the payments provided hereunder be exempt from the requirements of Section 409A of the Internal Revenue Code of 1986, as amended ("Section 409A") to the maximum extent possible, or to the extent Section 409A is applicable to this Agreement, the Company and Executive intend that this Agreement and any payments thereunder comply with the deferral, payout and other limitations and restrictions imposed under Section 409A. Notwithstanding anything herein to the contrary, this Agreement is intended to be interpreted, operated and administered in a manner consistent with such intentions; provided, however that in no event shall the Company or any of its affiliates (or any of their successors) be liable for any additional tax, interest or penalty that may be imposed on the Executive pursuant to Section 409A or for any damages incurred by the Executive as a result of this Agreement (or the payments hereunder) failing to comply with, or be exempt from Section 409A. Without limiting the generality of the foregoing, and notwithstanding any other provision of this Agreement to the contrary if at the time the Executive's employment hereunder terminates, the Executive is a "specified employee" within the meaning of Section 409A, then to the extent necessary to avoid subjecting the Executive to the imposition of any additional tax or interest under Section 409A, amounts that would (but for this provision) be payable within six months following the date of the Executive's separation from service shall not be paid to the Executive during such period, but shall instead be paid in a lump sum on the first payroll date that occurs on or after the date six months and one day following the date of such Executive's separation from service or, if earlier, upon the Executive's death.

23. Knowing and Voluntary Acknowledgement. Executive agrees and acknowledges that: (a) Executive has read the terms of this Agreement and understands all of its terms; (b) Executive is hereby advised of Executive's right to consult with an attorney of his choice prior to executing this Agreement; (c) this Agreement represents an important legal and binding agreement, that he is executing this Agreement voluntarily, free from duress, undue pressure or influence, harassment or intimidation and that he enters into it with full knowledge of its intent and terms; and (d) he is not waiving or releasing rights or claims that may arise after his execution of this Agreement.

Executive understands and agrees that Executive has been given at least 21 days (the "Consideration Period") within which to consider this Agreement and its ramifications and discuss the terms of this Agreement with the Company before executing it. Executive further acknowledges that any modification of this Agreement, whether material or immaterial, will not restart or change the Consideration Period.

Executive further understands and agrees that once Executive signs this Agreement, he will have an additional 7 days in which to revoke his acceptance of this Agreement. To do so, Executive must provide notice of revocation prior to the expiration of the 7-day revocation period to Mark Rakic, Senior Vice President of Human Resources in writing via hand delivery, fax at (408)-764-4820 or by e-mail to, if using email, with a copy to, or to their designated successors. Provided Executive has not revoked his acceptance of this Agreement during such 7-day revocation period, this Agreement shall become effective the eighth day after the Executive signs this Agreement ("Effective Date").

Executive acknowledges that, even if this Agreement is not executed or is canceled or revoked by Executive, the provisions of the Employee Agreement, that otherwise by their terms survive termination of Executive's employment shall remain in full force and effect.

24. Counterparts. This Agreement may be signed in counterparts, each of which will be deemed an original, but all of which, taken together, will constitute the same instrument; provided, however, that this Agreement will be of no force or effect unless executed by both Parties. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, e.g., www.docusign.com) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

25. Captions. Captions and headings of the sections and paragraphs of this Agreement are intended solely for convenience and no provision of this Agreement is to be construed by reference to the caption or heading of any section or paragraph.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the dates indicated below.

| **COHERENT, INC.** | | **JOHN R. AMBROSEO** |
|---|---|---|
| By: | /s/Kevin Palatnik | /s/ John Ambroseo |
| Its: | EVP & CFO | |
| Dated: | April 13, 2019 | Dated: April 13, 2019 |

**EXHIBIT A**

**GENERAL RELEASE OF CLAIMS**

This General Release of Claims ("Release") is entered into on the date set forth below by John R. Ambroseo ("Executive") and Coherent, Inc. for and on behalf of itself and its predecessors, successors, assigns, parents, subsidiaries, branches, affiliated entities and related entities (collectively, "Company"). In consideration for the Benefits or Change of Control Benefits set forth in the CEO Transition and Retirement Agreement dated ___________________ ("Agreement") and as a condition to Executive's right to receive the Benefits or Change of Control Benefits (as described and set forth in the Agreement), Executive hereby agrees as follows:

1. Waiver and Release. To the extent permitted by applicable law, in exchange for the consideration provided in the Agreement, Executive, for himself and his heirs, executors, representatives, agents, insurers, administrators, successors and assigns (collectively, "Releasors") irrevocably and unconditionally fully and forever waives, releases and discharges the Company and each and all of its present and former officers, agents, directors, managers, employees, representatives, affiliates, shareholders, attorneys, members, and each of their successors and assigns, and all persons acting by, through, under or in concert with, and individually in their official capacities (collectively, "Releasees") from any and all claims, demands, actions, causes of action, obligations, judgments, rights, fees, damages, liabilities and expenses (inclusive of attorneys' fees) of any kind whatsoever, whether known or unknown (collectively, "Claim" or "Claims"), including, without limitation, any Claims under any federal, state, local or foreign law, that Releasors may have, have ever had or may in the future have arising out of, or in any way related to Executive's hire, benefits, employment, termination or separation from employment and any actual or alleged act, omission, transaction, practice, conduct, occurrence or other matter that existed or arose on or before the date of his execution of this Release, including, but not limited to any claims, under (as amended) the United States Constitution, Title VII of the Civil Rights Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, the Equal Pay Act, the Employee Retirement Income Security Act (with respect to unvested benefits), the Civil Rights Act of 1991, 42 U.S.C. section 1981, the Sarbanes-Oxley Act of 2002, the Worker Adjustment and Retraining Notification Act, the Family Medical Leave Act, the Rehabilitation Act, the Occupational Safety and Health Act, the Fair Labor Standards Act, the California Fair Employment and Housing Act, the California Family Rights Act, the California Business and Professions Codes, Civil Code, Labor Code, and Government Code, and/or any other federal, state or local law (statutory, regulatory or otherwise) that may be legally waived and released and any common law tort and/or contract claims, including, but not limited to, any claims of wrongful discharge, defamation, emotional distress,

tortious interference with contract, invasion of privacy, nonphysical injury, personal injury or sickness or any other harm.

Nothing in this Release or the Agreement will be construed to (i) limit or affect Executive's right to challenge the validity of this release; (ii) in any way interfere with Executive's right and responsibility to give truthful testimony under oath; or (iii) prohibit Executive from participating in an investigation, filing a charge or otherwise communicating with any federal, state or local government office, official or agency, including, but not limited to, the Equal Employment Opportunity Commission, Department of Labor, National Labor Relations Board, or the Securities and Exchange Commission. However, Executive expressly promises never to seek or accept any compensatory damages, back pay, front pay, or reinstatement remedies with respect any Claim that Executive has released in this Release or the Agreement. Furthermore, this waiver and release of claims excludes, and Executive does not waive, release or discharge, any claims under state workers' compensation or unemployment laws Executive has against the Company and/or any claims by Executive that cannot be released by a private settlement agreement. In addition, nothing in this Release waives, releases or discharges (i) any claim regarding rights of indemnification and receipt of legal fees and expenses to which you are entitled under the Indemnification Agreement made between the Company and Executive, the Company's or an affiliate of the Company's Certificate of Incorporation or By-laws (or similar instrument) or pursuant to applicable law or (ii) any of Executive's vested rights under the Coherent, Inc. 401(k) Retirement Plan, the Coherent, Inc. Deferred Compensation Plan or health benefit programs.

Executive affirms that he has been paid and/or has received all compensation, wages, bonuses and/or benefits to which he may be entitled and no other compensation, wages, bonuses and/or benefits are due to Executive except as provided in the Agreement. Executive represents that he has reported all injuries and illnesses arising out of Executive's employment with the Company; has been properly provided any leave of absence required by applicable law because of his or a family members' health condition or any other qualifying leave; and has not been subject to any improper treatment, conduct, or actions due to a request for or taking such leave.

2. Unknown Claims. Executive agrees that his waiver and release of claims extends to all Claims of every nature and kind, known or unknown, suspected or unsuspected, past or present, arising from or attributable to Executive's employment or separation of employment with the Company. Executive therefore waives the protection of California Civil Code section 1542 or any analogous state law or federal law or regulation. Section 1542 reads as follows:

A general release does not extend to claims which the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her, would have materially affected his or her settlement with the debtor or released party.

3. Knowing and Voluntary Acknowledgement. Executive agrees and acknowledges that: (a) Executive has read the terms of this Release and understands all of its terms; (b) Executive is hereby advised of Executive's right to consult with an attorney of his choice prior to executing this Release; (c) this Release represents an important legal and binding agreement, that he is executing this Release voluntarily, free from duress, undue pressure or influence, harassment or intimidation and that he enters into it with full knowledge of its intent and terms; and (d) he is not waiving or releasing rights or claims that may arise after his execution of this Release.

Executive understands and agrees that Executive has been given at least 21 days (the "Release Consideration Period") within which to consider this Release and its ramifications and discuss the terms of this Release with the Company before executing it. Executive further acknowledges that any modification of this Release, whether material or immaterial, will not restart or change the Release Consideration Period.

Executive further understands and agrees that once Executive signs this Release, he will have an additional 7 days in which to revoke this Release. To do so, Executive must provide notice of revocation prior to the expiration of the 7-day revocation period to Mark Rakic, Senior Vice President of Human Resources in writing via hand delivery, fax at (408)-764-4820 or by e-mail to Mark.Rakic@coherent.com, if using email, with a copy to bret.dimarco@coherent.com, or their designated successors. Provided Executive has not revoked this Release during such 7-day revocation period, this Release shall become effective the eighth day after the Executive signs this Release ("Release Effective Date").

IN WITNESS WHEREOF, Executive has executed this Release as of the date indicated below.

______________________________

Dated: ________________________

**Exhibit 31.1**

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER**

**I, John R. Ambroseo, certify that:**

1. I have reviewed this quarterly report on Form 10-Q of Coherent, 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.

Date: May 8, 2019

/s/: JOHN R. AMBROSEO

John R. Ambroseo
President and Chief Executive Officer

**Exhibit 31.2**

**CERTIFICATION OF CHIEF FINANCIAL OFFICER**

**I, Kevin S. Palatnik, certify that:**

1. I have reviewed this quarterly report on Form 10-Q of Coherent, 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.

Date: May 8, 2019

/s/: KEVIN S. PALATNIK

Kevin S. Palatnik
Executive Vice President and Chief Financial Officer

**Exhibit 32.1**

**Certification of Chief Executive Officer Pursuant to 18 U.S.C. Section 1350,**
**As Adopted Pursuant to Section 906 of the As Sarbanes-Oxley Act of 2002**

I, John R. Ambroseo, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Coherent, Inc. on Form 10-Q for the fiscal quarter ended March 30, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that the information contained in such Quarterly Report on Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of Coherent, Inc.

Date: May 8, 2019

/s/: JOHN R. AMBROSEO

John R. Ambroseo
President and Chief Executive Officer

**Exhibit 32.2**

**Certification of Chief Financial Officer Pursuant to 18 U.S.C. Section 1350,**
**As Adopted Pursuant to Section 906 of the As Sarbanes-Oxley Act of 2002**

I, Kevin Palatnik, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Coherent, Inc. on Form 10-Q for the fiscal quarter ended March 30, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that the information contained in such Quarterly Report on Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of Coherent, Inc.

Date: May 8, 2019

/s/: KEVIN S. PALATNIK

Kevin S. Palatnik
Executive Vice President and Chief Financial Officer