UNIVERSAL DISPLAY CORP \PA\
Form 10-Q
May 03, 2018

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended March 31, 2018

OR

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

Commission File Number 1-12031

UNIVERSAL DISPLAY CORPORATION

(Exact name of registrant as specified in its charter)

Pennsylvania	23-2372688
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

375 Phillips Boulevard, Ewing, New Jersey	08618
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (609) 671-0980

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

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

Large accelerated filer		Accelerated filer
Non-accelerated filer	(Do not check if a smaller reporting company)	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 account standards provided pursuant to Section 13(a) of the Exchange Act.

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

As of April 30, 2018, the registrant had outstanding 47,086,098 shares of common stock.

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PART I – FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS
UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

(UNAUDITED)

(in thousands, except share and per share data)

	March 31, 2018	December 31, 2017
ASSETS		
CURRENT ASSETS:		
Cash and cash equivalents	$177,154	$ 132,840
Short-term investments	280,103	287,446
Accounts receivable	22,768	52,355
Inventory	53,638	36,265
Other current assets	14,301	10,276
Total current assets	547,964	519,182
PROPERTY AND EQUIPMENT, net of accumulated depreciation of $38,525 and $36,368	58,428	56,450
ACQUIRED TECHNOLOGY, net of accumulated amortization of $96,461 and $91,312	126,380	131,529
OTHER INTANGIBLE ASSETS, net of accumulated amortization of $2,342 and $2,000	14,498	14,840
GOODWILL	15,535	15,535
INVESTMENTS	—	14,794
DEFERRED INCOME TAXES	29,944	27,022
OTHER ASSETS	2,391	604
TOTAL ASSETS	$795,140	$ 779,956
LIABILITIES AND SHAREHOLDERS' EQUITY		
CURRENT LIABILITIES:		
Accounts payable	$10,434	$ 13,774
Accrued expenses	29,033	35,019
Deferred revenue	59,736	14,981
Other current liabilities	25	50
Total current liabilities	99,228	63,824
DEFERRED REVENUE	19,500	23,902
RETIREMENT PLAN BENEFIT LIABILITY	33,763	33,176
Total liabilities	152,491	120,902
COMMITMENTS AND CONTINGENCIES (Note 13)		
SHAREHOLDERS' EQUITY:		
Preferred Stock, par value $0.01 per share, 5,000,000 shares authorized, 200,000	2	2

shares of Series A Nonconvertible Preferred Stock issued and outstanding (liquidation value of $7.50 per share or $1,500)		
Common Stock, par value $0.01 per share, 100,000,000 shares authorized, 48,574,065 and 48,476,034 shares issued, and 47,212,428 and 47,118,171 shares outstanding, at March 31, 2018 and December 31, 2017, respectively	486	485
Additional paid-in capital	609,404	611,063
Retained earnings	84,360	99,126
Accumulated other comprehensive loss	(10,968)	(11,464)
Treasury stock, at cost (1,361,637 and 1,357,863 shares at March 31, 2018 and December 31, 2017, respectively)	(40,635)	(40,158)
Total shareholders' equity	642,649	659,054
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$795,140	$ 779,956

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

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UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF INCOME

(UNAUDITED)

(in thousands, except share and per share data)

	Three Months Ended March 31, 2018	2017
REVENUE	$43,572	$55,566
COST OF SALES	7,458	12,987
Gross margin	36,114	42,579
OPERATING EXPENSES:		
Research and development	12,357	11,818
Selling, general and administrative	10,791	10,077
Amortization of acquired technology and other intangible assets	5,491	5,492
Patent costs	1,725	1,547
Royalty and license expense	1,231	1,587
Total operating expenses	31,595	30,521
OPERATING INCOME	4,519	12,058
Interest income, net	1,271	671
Other expense, net	(47)	(19)
Interest and other expense, net	1,224	652
INCOME BEFORE INCOME TAXES	5,743	12,710
INCOME TAX BENEFIT (EXPENSE)	216	(2,345)
NET INCOME	$5,959	$10,365
NET INCOME PER COMMON SHARE:		
BASIC	$0.13	$0.22
DILUTED	$0.13	$0.22
WEIGHTED AVERAGE SHARES USED IN COMPUTING NET INCOME PER COMMON SHARE:		
BASIC	46,783,158	46,661,559
DILUTED	46,848,798	46,742,894
CASH DIVIDENDS DECLARED PER COMMON SHARE	$0.06	$0.03

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

UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(UNAUDITED)

(in thousands)

	Three Months Ended March 31,	
	2018	2017
NET INCOME	$5,959	$10,365
OTHER COMPREHENSIVE INCOME, NET OF TAX:		
Unrealized gain (loss) on available-for-sale securities, net of tax of $15 and $8, respectively	54	(15)
Employee benefit plan:		
Amortization of prior service cost and actuarial loss for retirement plan included in net periodic pension costs, net of tax of $117 and $163, respectively	422	299
Net change for employee benefit plan	422	299
Change in cumulative foreign currency translation adjustment	20	30
TOTAL OTHER COMPREHENSIVE INCOME	496	314
COMPREHENSIVE INCOME	$6,455	$10,679

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

UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENT OF SHAREHOLDERS’ EQUITY

(UNAUDITED)

(in thousands, except for share data)

	Series A Nonconvertible Preferred Stock		Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Treasury Stock		Total Shareholders’ Equity
	Shares	Amount	Shares	Amount				Shares	Amount	
BALANCE, DECEMBER 31, 2017	200,000	$2	48,476,034	$485	$611,063	$99,126	$(11,464)	1,357,863	$(40,158)	$659,054
ASC Topic 606 Adoption	—	—	—	—	—	(17,894)	—	—	—	(17,894)
ADJUSTED BALANCE, JANUARY 1, 2018	200,000	2	48,476,034	485	611,063	81,232	(11,464)	1,357,863	(40,158)	641,160
Net income	—	—	—	—	—	5,959	—	—	—	5,959
Other comprehensive income	—	—	—	—	—	—	496	—	—	496
Cash dividend	—	—	—	—	—	(2,831)	—	—	—	(2,831)
Issuance of common stock to employees	—	—	130,911	1	2,723	—	—	—	—	2,724
Shares withheld for employee taxes	—	—	(48,707)	—	(5,832)	—	—	—	—	(5,832)
Common shares repurchased	—	—	—	—	—	—	—	3,774	(477)	(477)
Issuance of common stock to Board of Directors and Scientific Advisory Board	—	—	13,482	—	1,197	—	—	—	—	1,197
	—	—	2,345	—	253	—	—	—	—	253

Issuance of common stock to employees under an ESPP										
BALANCE, MARCH 31, 2018	200,000	$2	48,574,065	$486	$609,404	$84,360	$(10,968)	1,361,637	$(40,635)	$642,649

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

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UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

(UNAUDITED)

(in thousands)

	Three Months Ended March 31, 2018	2017
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$5,959	$10,365
Adjustments to reconcile net income to net cash provided by operating activities:		
Amortization of deferred revenue	(12,589)	(2,690)
Depreciation	2,172	1,210
Amortization of intangibles	5,491	5,492
Amortization of premium and discount on investments, net	(966)	(562)
Stock-based compensation to employees	2,776	3,141
Stock-based compensation to Board of Directors and Scientific Advisory Board	897	709
Earnout liability recorded for Adesis acquisition	—	294
Deferred income tax expense	72	1,049
Retirement plan expense	1,126	1,005
Decrease (increase) in assets:		
Accounts receivable	29,587	(11,327)
Inventory	(17,373)	646
Other current assets	(4,025)	616
Other assets	(177)	92
Increase (decrease) in liabilities:		
Accounts payable and accrued expenses	(4,441)	(8,283)
Other current liabilities	(25)	(219)
Deferred revenue	30,331	106
Net cash provided by operating activities	38,815	1,644
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchases of property and equipment	(8,733)	(631)
Purchases of investments	(123,375)	(170,136)
Proceeds from sale of investments	146,546	130,647
Net cash provided by (used in) investing activities	14,438	(40,120)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock	201	159
Repurchase of common stock	(477)	—
Proceeds from the exercise of common stock options	—	24
Payment of withholding taxes related to stock-based compensation to employees	(5,832)	(3,541)
Cash dividends paid	(2,831)	(1,414)
Net cash used in financing activities	(8,939)	(4,772)
INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	44,314	(43,248)
CASH AND CASH EQUIVALENTS, BEGINNING OF PERIOD	132,840	139,365

CASH AND CASH EQUIVALENTS, END OF PERIOD	$177,154	$96,117
The following non-cash activities occurred:		
Unrealized gain (loss) on available-for-sale securities	$69	$(23)
Common stock issued to Board of Directors and Scientific Advisory Board that was earned and accrued for in a previous period	300	300
Common stock issued to employees that was earned and accrued for in a previous period	—	174
Net change in accounts payable and accrued expenses related to purchases of property and equipment	4,583	1,928

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

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UNIVERSAL DISPLAY CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(UNAUDITED)

1. BUSINESS:

Universal Display Corporation (the Company) is a leader in the research, development and commercialization of organic light emitting diode (OLED) technologies and materials for use in display and solid-state lighting applications. OLEDs are thin, lightweight and power-efficient solid-state devices that emit light that can be manufactured on both flexible and rigid substrates, making them highly suitable for use in full-color displays and as lighting products. OLED displays are capturing a growing share of the display market. The Company believes this is because OLEDs offer potential advantages over competing display technologies with respect to power efficiency, contrast ratio, viewing angle, video response time, form factor and manufacturing cost. The Company also believes that OLED lighting products have the potential to replace many existing light sources in the future because of their high power efficiency, excellent color rendering index, low operating temperature and novel form factor. The Company's technology leadership and intellectual property position should enable it to share in the revenues from OLED displays and lighting products as they enter mainstream consumer and other markets.

The Company's primary business strategy is to (1) further develop and license its proprietary OLED technologies to manufacturers of products for display applications, such as mobile phones, televisions, tablets, wearables, portable media devices, notebook computers, personal computers, and automotive interiors, and specialty and general lighting products; and (2) develop new OLED materials and sell existing and any new materials to those product manufacturers. The Company has established a significant portfolio of proprietary OLED technologies and materials, primarily through internal research and development efforts and acquisitions of patents and patent applications, as well as maintaining its relationships with world-class partners such as Princeton University (Princeton), the University of Southern California (USC), the University of Michigan (Michigan) and PPG Industries, Inc. (PPG Industries). The Company currently owns, exclusively licenses or has the sole right to sublicense more than 4,500 patents issued and pending worldwide.

The Company sells its proprietary OLED materials to customers for evaluation and use in commercial OLED products. The Company also enters into agreements with manufacturers of OLED display and lighting products under which it grants them licenses to practice under its patents and to use the Company's proprietary know-how. At the same time, the Company works with these and other companies who are evaluating the Company's OLED technologies and materials for possible use in commercial OLED display and lighting products.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

Interim Financial Information

In the opinion of management, the accompanying unaudited consolidated financial statements contain all adjustments (consisting of only normal recurring adjustments) necessary to present fairly the Company's financial position as of March 31, 2018 and results of operations for the three months ended March 31, 2018 and 2017, and cash flows for the three months ended March 31, 2018 and 2017. While management believes that the disclosures presented are adequate to make the information not misleading, these unaudited consolidated financial statements should be read in conjunction with the audited consolidated financial statements and the notes thereto in the Company's latest year-end financial statements, which are included in the Company's Annual Report on Form 10-K for the year ended December 31, 2017. The results of the Company's operations for any interim period are not necessarily indicative of the results of operations for any other interim period or for the full year.

Principles of Consolidation

The consolidated financial statements include the accounts of Universal Display Corporation and its wholly owned subsidiaries, UDC, Inc., UDC Ireland Limited, Universal Display Corporation Hong Kong, Limited, Universal Display Corporation Korea, Y.H., Universal Display Corporation Japan GK, Universal Display Corporation China, Ltd. and Adesis, Inc. (Adesis). All intercompany transactions and accounts have been eliminated.

Business Combinations

Accounting for acquisitions requires the Company to recognize separately from goodwill the assets acquired and the liabilities assumed at the acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred over the net of the acquisition date fair values of the assets acquired and the liabilities assumed. While the Company uses its best estimates and assumptions to accurately value assets acquired and liabilities assumed at the acquisition date as well as contingent consideration, where applicable, the estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which is the period when all information necessary is obtained, but not to exceed one year from the acquisition date, adjustments may be recorded to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the consolidated statements of income.

Management’s Use of Estimates

The preparation of financial statements in conformity with U.S. 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 financial statements and the reported amounts of revenues and expenses during the reporting period. The estimates made are principally in the areas of revenue recognition including estimates of material unit sales and royalties, the useful life of acquired intangibles, the use and recoverability of inventories, intangibles and income taxes including realization of deferred tax assets, stock-based compensation and retirement benefit plan liabilities. Actual results could differ from those estimates.

Inventories

Inventories consist of raw materials, work-in-process and finished goods, including inventory consigned to customers, and are stated at the lower of cost, determined on a first-in, first-out basis, or net realizable value. Inventory valuation and firm committed purchase order assessments are performed on a quarterly basis and those items that are identified to be obsolete or in excess of forecasted usage are written down to their estimated net realizable value. Estimates of net realizable value are based upon management’s analyses and assumptions, including, but not limited to, forecasted sales levels by product, expected product lifecycle, product development plans and future demand requirements. A 12-month rolling forecast based on factors, including, but not limited to, production cycles, anticipated product orders, marketing forecasts, backlog, and shipment activities is used in the inventory analysis. If market conditions are less favorable than forecasts or actual demand from customers is lower than estimates, additional inventory write-downs may be required. If demand is higher than expected, inventories that had previously been written down may be sold.

Certain of the Company’s customers have assumed the responsibility for maintaining the Company's inventory at their location based on the customers’ demand forecast. Notwithstanding the fact that the Company builds and ships the inventory, the customer does not purchase the consigned inventory until the inventory is drawn or pulled by the customer to be used in the manufacture of the customer’s product. Though the consigned inventory may be at the customer’s physical location, it remains inventory owned by the Company until the inventory is drawn or pulled, which is the time at which the sale takes place.

Fair Value of Financial Instruments

The carrying values of accounts receivable, other current assets, and accounts payable approximate fair value in the accompanying financial statements due to the short-term nature of those instruments. The Company’s other financial instruments, which include cash equivalents and investments, are carried at fair value.

Revenue Recognition and Deferred Revenue

Material sales relate to the Company's sale of its OLED materials for incorporation into its customers' commercial OLED products or for their OLED development and evaluation activities. Material sales are recognized at the time title passes, which is typically at the time of shipment or at the time of delivery, depending upon the contractual agreement between the parties.

The rights and benefits to the Company's OLED technology are conveyed to the customer through technology license agreements and material supply agreements. These agreements are combined and the licenses and materials sold under these combined agreements are not distinct from each other for financial reporting purposes and as such, are accounted for as a single performance obligation. Accordingly, total contract consideration is estimated and recognized over the contract term based on material units sold during the period at their estimated per unit fee. Total contract consideration includes fixed amounts designated in contracts with customers as license fees as well as estimates of material fees and royalties to be earned.

Various estimates are relied upon to recognize revenue. The Company estimates total material units to be purchased by its customers over the contract term based on historical trends, industry estimates and its forecast process and related amounts to be charged. Additionally, management estimates the total sales-based royalties based on the estimated net sales revenue of its customers over the contract term.

Contract research services revenue is revenue earned by Adesis through performing organic and organometallic synthetics research, development and commercialization on a contractual basis. These services range from intermediates for structure-activity relationship studies, reference agents and building blocks for combinatorial synthesis, re-synthesis of key intermediates, specialty organic chemistry needs, and selective toll manufacturing. These services are provided to third-party pharmaceutical and life sciences firms and other technology firms at fixed costs or on an annual contract basis. Revenue is recognized as services are performed with billing schedules and payment terms negotiated on a contract-by-contract basis. Payments received in excess of revenue recognized are recorded as deferred revenue. In other cases, services may be provided and revenue is recognized before the client is invoiced. In these cases, revenue recognized will exceed amounts billed and the difference, representing amounts which are currently unbillable to the customer pursuant to contractual terms, is recorded as an unbilled receivable.

Technology development and support revenue is revenue earned from government contracts, development and technology evaluation agreements and commercialization assistance fees, which includes reimbursements by government entities for all or a portion of the research and development costs the Company incurs in relation to its government contracts. Revenues are recognized proportionally as research and development costs are incurred, or as defined milestones are achieved, and are included in contract research services in the accompanying consolidated statements of income.

Currently, the Company's most significant commercial license agreement is with Samsung Display Co., Ltd. (SDC). This agreement, which covers the manufacture and sale of specified OLED display materials, was effective as of January 1, 2018 and lasts through the end of 2022 with an additional two-year extension option. Under this agreement, the Company is being paid a license fee, payable in quarterly installments over the agreement term of five years. The agreement conveys to SDC the non-exclusive right to use certain of the Company's intellectual property assets for a limited period of time that is less than the estimated life of the assets.

At the same time the Company entered into the current patent license agreement with SDC, the Company also entered into a new supplemental material purchase agreement with SDC. Under the current supplemental material purchase agreement, SDC agrees to purchase from the Company a minimum amount of phosphorescent emitter materials for use in the manufacture of licensed products. This minimum commitment is subject to SDC’s requirements for phosphorescent emitter materials and the Company’s ability to meet these requirements over the term of the supplemental agreement.

In 2015, the Company entered into an OLED patent license agreement and an OLED commercial supply agreement with LG Display Co., Ltd. (LG Display) which were effective as of January 1, 2015 and superseded the existing 2007 commercial supply agreement between the parties. The new agreements have a term that is set to expire by the end of 2022. The patent license agreement provides LG Display a non-exclusive, royalty bearing portfolio license to make and sell OLED displays under the Company's patent portfolio. The patent license calls for license fees, prepaid royalties and running royalties on licensed products. The agreements include customary provisions relating to warranties, indemnities, confidentiality, assignability and business terms. The agreements provide for certain other minimum obligations relating to the volume of material sales anticipated over the life of the agreements as well as minimum royalty revenue to be generated under the patent license agreement. The Company expects to generate revenue under these agreements that are predominantly tied to LG Display’s sales of OLED licensed products. The OLED commercial supply agreement provides for the sale of materials for use by LG Display, which may include phosphorescent emitters and host materials.

In 2017, the Company entered into long-term, multi-year agreements with BOE Technology Group Co., Ltd. (BOE). Under these agreements, the Company has granted BOE non-exclusive license rights under various patents owned or controlled by the Company to manufacture and sell OLED display products. The Company has also agreed to supply phosphorescent OLED materials to BOE.

In 2016, the Company entered into OLED patent license and material purchase agreements having five year durations with Tianma Micro-electronics Co., Ltd. (Tianma). Under the license agreement, the Company has granted Tianma non-exclusive license rights under various patents owned or controlled by the Company to manufacture and sell OLED display products. The license agreement calls for license fees and running royalties on licensed products. Additionally, the Company expects to supply phosphorescent OLED materials to Tianma for use in its licensed products.

The Company records taxes billed to customers and remitted to various governmental entities on a gross basis in both revenues and cost of material sales in the consolidated statements of income. The amounts of these pass through taxes reflected in revenues and cost of material sales were \$6,000 and \$56,000 for the three months ended March 31, 2018 and 2017, respectively.

All sales transactions are billed and due within 90 days and substantially all are transacted in U.S. dollars.

Cost of Sales

Cost of sales consists of labor and material costs associated with the production of materials processed at the Company's manufacturing partners and at the Company's internal manufacturing processing facility. The Company’s portion of cost of sales also includes depreciation of manufacturing equipment, as well as manufacturing overhead costs and inventory adjustments for excess and obsolete inventory.

Research and Development

Expenditures for research and development are charged to expense as incurred.

Patent Costs

Costs associated with patent applications, patent prosecution, patent defense and the maintenance of patents are charged to expense as incurred. Costs to successfully defend a challenge to a patent are capitalized to the extent of an evident increase in the value of the patent. Costs that relate to an unsuccessful outcome are charged to expense.

Amortization of Acquired Technology

Amortization costs relate to technology acquired from BASF, Fujifilm and Motorola. These acquisitions were completed in the years ended December 31, 2016, 2012 and 2011, respectively. Acquisition costs are being amortized over a period of 10 years for the BASF and Fujifilm patents and 7.5 years for the Motorola patents.

Amortization of Other Intangible Assets

Other intangible assets from the Adesis acquisition are being amortized over a period of 10 to 15 years. See Note 6 for further discussion.

Translation of Foreign Currency Financial Statements and Foreign Currency Transactions

The Company's reporting currency is the U.S. dollar. The functional currency for the Company's Ireland subsidiary is also the U.S. dollar and the functional currency for each of the Company's Asia-Pacific foreign subsidiaries is its local currency. The Company translates the amounts included in the consolidated statements of income from its Asia-Pacific foreign subsidiaries into U.S. dollars at weighted-average exchange rates, which the Company believes are representative of the actual exchange rates on the dates of the transactions. The Company's foreign subsidiaries' assets and liabilities are translated into U.S. dollars from the local currency at the actual exchange rates as of the end of each reporting date, and the Company records the resulting foreign exchange translation adjustments in the consolidated balance sheets as a component of accumulated other comprehensive loss. The overall effect of the translation of foreign currency and foreign currency transactions to date has been insignificant.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. The Company recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount of which the likelihood of realization is greater than 50%. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs. The Company records interest and penalties, if any, related to unrecognized tax benefits as a component of tax expense.

Share-Based Payment Awards

The Company recognizes in the consolidated statements of income the grant-date fair value of equity based awards such as shares issued under employee stock purchase plans, restricted stock awards, restricted stock units and performance unit awards issued to employees and directors.

The grant-date fair value of stock awards is based on the closing price of the stock on the date of grant. The fair value of share-based awards is recognized as compensation expense on a straight-line basis over the requisite service period, net of forfeitures. The Company issues new shares upon the respective grant, exercise or vesting of the share-based payment awards, as applicable.

Performance unit awards are subject to either a performance-based or market-based vesting requirement. For performance-based vesting, the grant-date fair value of the award, based on fair value of the Company's common stock, is recognized over the service period based on an assessment of the likelihood that the applicable performance goals will be achieved and compensation expense is periodically adjusted based on actual and expected performance. Compensation expense for performance unit awards with market-based vesting is calculated based on the estimated fair value as of the grant date utilizing a Monte Carlo simulation model and is recognized over the service period on a straight-line basis.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued a new revenue recognition standard entitled Accounting Standards Codification (“ASC”) Topic 606, Revenue from Contracts with Customers. The objective of the standard is to establish the principles that an entity shall apply to report useful information to users of financial statements about the nature, amount, timing, and uncertainty of revenue and cash flows from a contract with a customer. The standard is effective for annual reporting periods beginning after December 15, 2017. The Company adopted the standard beginning January 1, 2018 using the “modified retrospective” approach, meaning the standard was applied only to the most current period presented in the financial statements, with a cumulative adjustment to retained earnings.

The new standard impacts how the Company recognizes revenue on its commercial license and material supply agreements with customers. In addition, the Company previously recognized royalty revenue one quarter in arrears based on sales information received from its customers typically received after disclosing that quarter’s results. Under ASC Topic 606, royalties to be earned over the contract term are estimated as part of total contract consideration and recognized as noted below. The estimates are updated on a quarterly basis.

The rights and benefits to the Company’s OLED technology are conveyed to the customer through technology license agreements and material supply agreements. These agreements are combined and the licenses and materials sold under these combined agreements are not distinct from each other for financial reporting purposes and as such, are accounted for as a single performance obligation. Accordingly, total contract consideration is estimated and recognized over the contract term based on material units sold at its estimated per unit fee.

Adoption of the new standard resulted in an increase in deferred revenue of $21.3 million offset by a reduction of retained earnings of $17.9 million, net of tax of $3.1 million, and unbilled receivables of $0.3 million as of January 1, 2018. The impact of the new standard to revenue for the three months ended March 31, 2018 was a decrease to revenues of $24.7 million from the amount that would have been recorded under the prior accounting standard. See Note 16 for further discussion.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which addresses the classification and recognition of lease assets and liabilities formerly classified as operating leases under generally accepted accounting principles. The guidance will address certain aspects of recognition and measurement, and quantitative and qualitative aspects of presentation and disclosure. The guidance is effective for fiscal years beginning after December 31, 2018, including interim periods within those fiscal years. The Company is evaluating the effect that ASU 2016-02 may have on its consolidated financial statements and related disclosures.

In August 2016, the FASB issued ASU No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments. The objective of the standard is to reduce diversity in practice in how certain transactions are classified in the statement of cash flows. The ASU provides additional clarification guidance on the classification of certain cash receipts and payments in the statement of cash flows. The new guidance is effective for fiscal years and interim periods within those years beginning after December 15, 2017, with early adoption permitted. Adoption of ASU 2016-15 did not have any impact on the Company's consolidated financial statements and related disclosures.

In October 2016, the FASB issued ASU No. 2016-16, Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory. ASU 2016-16 clarifies the accounting for the current and deferred income taxes for an intra-entity transfer of an asset other than inventory. ASU 2016-16 is effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years, with early adoption permitted. Adoption of ASU 2016-16, beginning January 1, 2018, did not have any impact on the Company's consolidated financial statements and related disclosures.

In January 2017, the FASB issued ASU No. 2017-04, Intangibles – Goodwill and Other (Topic 350): Simplifying the Test of Goodwill Impairment eliminating the requirement to calculate the implied fair value, essentially eliminating step two from the goodwill impairment test. The new standard requires goodwill impairment to be based upon the results of step one of the impairment test, which is defined as the excess of the carrying value of a reporting unit over its fair value. The impairment charge will be limited to the amount of goodwill allocated to that reporting unit. The standards update is effective prospectively for annual and interim goodwill impairment testing performed in fiscal years beginning after December 15, 2019, with early adoption permitted. The Company is evaluating the effect that adoption of ASU 2017-04 may have on its consolidated financial statements and related disclosures.

In May 2017, the FASB issued ASU 2017-09, Compensation – Stock Compensation (Topic 718): Scope of Modification Accounting. ASU 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting, in accordance with Topic 718. The guidance is effective for annual periods beginning after December 15, 2017, with early adoption permitted, and requires a prospective application to awards modified on or after the adoption date. The Company has not historically made changes to the terms or conditions of shared-based payment awards and the adoption of ASU 2017-09, beginning January 1, 2018, did not have any impact on the consolidated financial statements and related disclosures.

3. CASH, CASH EQUIVALENTS AND INVESTMENTS:

The Company considers all highly liquid debt instruments purchased with an original maturity of three months or less to be cash equivalents. The Company classifies its remaining investments as available-for-sale. These securities are carried at fair market value, with unrealized gains and losses reported in shareholders' equity. Gains or losses on securities sold are based on the specific identification method. Investments as of March 31, 2018 and December 31, 2017 consisted of the following (in thousands):

Investment Classification	Amortized Cost	Unrealized Gains	Unrealized (Losses)	Aggregate Fair Market Value
March 31, 2018				
Certificates of deposit	$ 1,499	$ 2	$ (1)	$ 1,500
Corporate bonds	189,124	5	(139)	188,990
U.S. Government securities	131,644	—	(187)	131,457
	$ 322,267	$ 7	$ (327)	$ 321,947
December 31, 2017				
Certificates of deposit	$ 1,296	$ 1	$ (1)	$ 1,296
Corporate bonds	104,626	—	(252)	104,374
U.S. Government securities	214,641	—	(139)	214,502
	$ 320,563	$ 1	$ (392)	$ 320,172

As of March 31, 2018 and December 31, 2017, there was $41.8 million of government securities and $17.9 million of corporate bonds included in cash equivalents in the consolidated balance sheet, respectively.

4. FAIR VALUE MEASUREMENTS:

The following table provides the assets and liabilities carried at fair value measured on a recurring basis as of March 31, 2018 (in thousands):

	Total carrying value as of March 31, 2018	Fair Value Measurements, Using Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents	$ 50,871	$ 50,871	$ —	$ —
Short-term investments	280,103	280,103	—	—
Long-term investments	—	—	—	—

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The following table provides the assets and liabilities carried at fair value measured on a recurring basis as of December 31, 2017 (in thousands):

	Total carrying value as of December 31, 2017	Fair Value Measurements, Using Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Cash equivalents	$ 27,532	$ 27,532	$ —	$ —
Short-term investments	287,446	287,446	—	—
Long-term investments	14,794	14,794	—	—

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities. Level 2 inputs are quoted prices for similar assets and liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the financial instrument. Level 3 inputs are unobservable inputs based on management's own assumptions used to measure assets and liabilities at fair value. A financial asset's or liability's classification is determined based on the lowest level input that is significant to the fair value measurement.

Changes in fair value of the investments are recorded as unrealized gains and losses in other comprehensive income. If a decline in fair value of an investment is deemed to be other than temporary, the cost of the Company's investment will be written down by the amount of the other-than-temporary impairment with a resulting charge to net income. There were no other-than-temporary impairments of investments as of March 31, 2018 or December 31, 2017.

5. INVENTORY:

Inventory consisted of the following (in thousands):

	March 31, 2018	December 31, 2017
Raw materials	$ 20,496	$ 17,464
Work-in-process	8,615	2,977
Finished goods	24,527	15,824
Inventory	$ 53,638	$ 36,265

6. GOODWILL AND INTANGIBLE ASSETS:

The Company monitors the recoverability of goodwill annually or whenever events or changes in circumstances indicate the carrying value may not be recoverable. Purchased intangible assets subject to amortization consist primarily of acquired technology and other intangible assets that include trade names, customer relationships and developed IP processes.

Acquired Technology

Acquired technology consists of acquired license rights for patents and know-how obtained from PD-LD, Inc., Motorola, BASF SE (BASF) and Fujifilm. These intangible assets consist of the following (in thousands):

	March 31, 2018
PD-LD, Inc.	$ 1,481
Motorola	15,909
BASF	95,989
Fujifilm	109,462
	222,841
Less: Accumulated amortization	(96,461)
Acquired technology, net	$ 126,380

Amortization expense related to acquired technology was $5.1 million for the three months ended March 31, 2018 and 2017, respectively. Amortization expense is included in amortization of acquired technology and other intangible assets expense line item on the consolidated statements of income and is expected to be $20.6 million in the year ending December 31, 2018, $20.5 million in each of the years ending December 31, 2019 through 2021, $15.8 million in the year ending December 31, 2022 and $33.6 million thereafter.

Motorola Patent Acquisition

In 2000, the Company entered into a royalty-bearing license agreement with Motorola whereby Motorola granted the Company perpetual license rights to what are now 74 issued U.S. patents relating to Motorola's OLED technologies, together with foreign counterparts in various countries. These patents will all expire in the U.S. by the end of 2018.

On March 9, 2011, the Company purchased these patents from Motorola, including all existing and future claims and causes of action for any infringement of the patents, pursuant to a Patent Purchase Agreement. The Patent Purchase Agreement effectively terminated the Company's license agreement with Motorola, including any obligation to make royalty payments to Motorola. The technology acquired from Motorola is being amortized over a period of 7.5 years.

Fujifilm Patent Acquisition

On July 23, 2012, the Company entered into a Patent Sale Agreement with Fujifilm. Under the agreement, Fujifilm sold more than 1,200 OLED-related patents and patent applications in exchange for a cash payment of $105.0 million, plus costs incurred in connection with the purchase. The agreement contains customary representations and warranties and covenants, including respective covenants not to sue by both parties thereto. The agreement permitted the Company to assign all of its rights and obligations under the agreement to its affiliates, and the Company assigned, prior to the consummation of the transactions contemplated by the agreement, its rights and obligations to UDC Ireland Limited (UDC Ireland), a wholly-owned subsidiary of the Company formed under the laws of the Republic of Ireland. The transactions contemplated by the agreement were consummated on July 26, 2012. The Company recorded the $105.0 million plus $4.5 million of purchase costs as acquired technology, which is being amortized over a period of 10 years.

BASF Patent Acquisition

On June 28, 2016, UDC Ireland entered into and consummated an IP Transfer Agreement with BASF. Under the IP Transfer Agreement, BASF sold to UDC Ireland all of its rights, title and interest to certain of its owned and co-owned intellectual property rights relating to the composition of, development, manufacture and use of OLED materials, including OLED lighting and display stack technology, as well as certain tangible assets. The intellectual property includes knowhow and more than 500 issued and pending patents in the area of phosphorescent materials and technologies. These assets were acquired in exchange for a cash payment of €86.8 million ($95.8 million). In addition, UDC Ireland also took on certain rights and obligations under three joint research and development agreements to which BASF was a party. The IP Transfer Agreement also contains customary representations, warranties and covenants of the parties. UDC Ireland recorded the payment of €86.8 million ($95.8 million) and acquisition costs incurred of $217,000 as acquired technology which is being amortized over a period of 10 years.

Other Intangible Assets

As a result of the Adesis acquisition, the Company recorded $16.8 million of other intangible assets, including $10.5 million assigned to customer relationships with a weighted average life of 11.5 years, $4.8 million of internally developed IP, processes and recipes with a weighted average life of 15 years, and $1.5 million assigned to trade name and trademarks with a weighted average life of 10 years. At March 31, 2018, these other intangible assets consist of the following (in thousands):

	Gross Carrying	Accumulated	Net Carrying

	Amount	Amortization	Amount
Customer relationships	$ 10,520	$ (1,540)	$ 8,980
Developed IP, processes and recipes	4,820	(547)	4,273
Trade name/Trademarks	1,500	(255)	1,245
Total identifiable intangible assets	$ 16,840	$ (2,342)	$ 14,498

Amortization expense related to other intangible assets was $342,000 and $343,000 for the three months ended March 31, 2018 and 2017, respectively. Amortization expense is included in the amortization of acquired technology and other intangible assets expense line item on the Consolidated Statements of Income and is expected to be $1.4 million for each of the next five fiscal years and $7.8 million thereafter.

7. RESEARCH AND LICENSE AGREEMENTS WITH PRINCETON UNIVERSITY, UNIVERSITY OF SOUTHERN CALIFORNIA AND THE UNIVERSITY OF MICHIGAN:

The Company funded OLED technology research at Princeton University and, on a subcontractor basis, at the University of Southern California for 10 years under a Research Agreement executed with Princeton University in August 1997 (the 1997 Research

Agreement). The principal investigator conducting work under the 1997 Research Agreement transferred to the University of Michigan in January 2006. Following this transfer, the 1997 Research Agreement was allowed to expire on July 31, 2007.

As a result of the transfer, the Company entered into a new Sponsored Research Agreement with the University of Southern California to sponsor OLED technology research and, on a subcontractor basis, with the University of Michigan. This new Sponsored Research Agreement (as amended, the 2006 Research Agreement) was effective as of May 1, 2006 and had an original term of three years. On May 1, 2009, the Company amended the 2006 Research Agreement to extend the term of the agreement for an additional four years. The 2006 Research Agreement superseded the 1997 Research Agreement with respect to all work being performed at the University of Southern California and the University of Michigan. Payments under the 2006 Research Agreement were made to the University of Southern California on a quarterly basis as actual expenses were incurred. The Company incurred a total of $5.0 million in research and development expense for work performed under the 2006 Research Agreement during the extended term, which ended on April 30, 2013.

Effective June 1, 2013, the Company amended the 2006 Research Agreement again to extend the term of the agreement for an additional four years. The Company incurred a total of $4.6 million in research and development expense for work performed under the 2006 Research Agreement during the extended term.

Effective May 1, 2017, the Company amended the 2006 Research Agreement once again to extend the term of the agreement for an additional three years. As of March 31, 2018, in connection with this amendment, the Company was obligated to pay the University of Southern California up to $6.4 million for work to be performed during the remaining extended term, which expires April 30, 2020. From May 1, 2017 through March 31, 2018, the Company incurred $797,000 in research and development expense for work performed under the 2006 Research Agreement.

On October 9, 1997, the Company, Princeton University and the University of Southern California entered into an Amended License Agreement (as amended, the 1997 Amended License Agreement) under which Princeton University and the University of Southern California granted the Company worldwide, exclusive license rights, with rights to sublicense, to make, have made, use, lease and/or sell products and to practice processes based on patent applications and issued patents arising out of work performed by Princeton University and the University of Southern California under the 1997 Research Agreement. Under this 1997 Amended License Agreement, the Company is required to pay Princeton University royalties for licensed products sold by the Company or its sublicensees. For licensed products sold by the Company, the Company is required to pay Princeton University 3% of the net sales price of these products. For licensed products sold by the Company's sublicensees, the Company is required to pay Princeton 3% of the revenues received by the Company from these sublicensees. These royalty rates are subject to renegotiation for products not reasonably conceivable as arising out of the 1997 Research Agreement if Princeton University reasonably determines that the royalty rates payable with respect to these products are not fair and competitive.

The Company is obligated, under the 1997 Amended License Agreement, to pay to Princeton University minimum annual royalties. The minimum royalty payment is $100,000 per year. The Company recorded royalty expense in connection with this agreement of $1.2 million and $1.6 million for the three months ended March 31, 2018 and 2017, respectively.

The Company also is required, under the 1997 Amended License Agreement, to use commercially reasonable efforts to bring the licensed OLED technology to market. However, this requirement is deemed satisfied if the Company invests a minimum of $800,000 per year in research, development, commercialization or patenting efforts respecting the patent rights licensed to the Company.

In connection with entering into the 2006 Research Agreement, the Company amended the 1997 Amended License Agreement to include the University of Michigan as a party to that agreement effective as of January 1, 2006. Under this amendment, Princeton University, the University of Southern California and the University of Michigan have granted the Company a worldwide exclusive license, with rights to sublicense, to make, have made, use, lease and/or sell products and to practice processes based on patent applications and issued patents arising out of work performed under the 2006 Research Agreement. The financial terms of the 1997 Amended License Agreement were not impacted by this amendment.

8. EQUITY AND CASH COMPENSATION UNDER THE PPG AGREEMENTS:

On September 22, 2011, the Company entered into an Amended and Restated OLED Materials Supply and Service Agreement with PPG Industries (the New OLED Materials Agreement), which replaced the original OLED Materials Agreement with PPG Industries effective as of October 1, 2011. The term of the New OLED Materials Agreement ran through December 31, 2015 and shall be automatically renewed for additional one year terms, unless terminated by the Company by providing prior notice of one year or terminated by PPG by providing prior notice of two years. The agreement was automatically renewed through December 31, 2018.

The New OLED Materials Agreement contains provisions that are substantially similar to those of the original OLED Materials Agreement. Under the New OLED Materials Agreement, PPG Industries continues to assist the Company in developing its proprietary OLED materials and supplying the Company with those materials for evaluation purposes and for resale to its customers.

Under the New OLED Materials Agreement, the Company compensates PPG Industries on a cost-plus basis for the services provided during each calendar quarter. The Company is required to pay for some of these services in all cash. Up to 50% of the remaining services are payable, at the Company's sole discretion, in cash or shares of the Company's common stock, with the balance payable in cash. The actual number of shares of common stock issuable to PPG Industries is determined based on the average closing price for the Company's common stock during a specified number of days prior to the end of each calendar half-year period ending on March 31 and September 30. If, however, this average closing price is less than $20.00, the Company is required to compensate PPG Industries in cash. No shares were issued for services to PPG for the three months ended March 31, 2018 or 2017.

The Company is also to reimburse PPG Industries for raw materials used for research and development. The Company records the purchases of these raw materials as a current asset until such materials are used for research and development efforts.

The Company recorded research and development expense of $361,000 and $104,000 for the three months ended March 31, 2018 and 2017, respectively, in relation to the cash portion of the reimbursement of expenses and work performed by PPG Industries, excluding amounts paid for commercial chemicals.

9. SHAREHOLDERS' EQUITY:

Common and Preferred Stock

The Company is authorized to issue 100 million shares of $0.01 par value common stock and five million shares of $0.01 par value preferred stock. Each share of the Company's common stock entitles the holder to one vote on all matters to be voted upon by the shareholders. As of March 31, 2018, the Company had issued 48,574,065 shares of common stock of which 47,212,428 were outstanding and had issued 200,000 shares of preferred stock, all of which were outstanding. During the three months ended March 31, 2018, the Company repurchased 3,774 shares of $0.01 par value common treasury stock valued at $477,000.

Scientific Advisory Board and Employee Awards

During the three months ended March 31, 2018 and 2017, the Company granted a total of 2,456 and 5,590 shares, respectively, of fully vested common stock to employees and non-employee members of the Scientific Advisory Board for services performed in 2017 and 2016, respectively. The fair value of shares issued to members of the Scientific Advisory Board was $300,000 for both three-month periods. No fully vested common stock was issued to employees during the three months ended March 31, 2018 and the fair value of the shares issued to employees during the three months ended March 31, 2017 was $165,000. In connection with the issuance of these grants, 605 shares, with fair value of $55,000, were withheld in satisfaction of employee tax withholding obligations in 2017.

Dividends

During the three months ended March 31, 2018, the Company declared and paid cash dividends of $0.06 per common share, or $2.8 million, on the Company's outstanding common stock.

On May 1, 2018, the Company's Board of Directors declared a second quarter dividend of $0.06 per common share to be paid on June 29, 2018. All future dividends will be subject to the approval of the Company's Board of Directors.

10. ACCUMULATED OTHER COMPREHENSIVE LOSS:

Amounts related to the changes in accumulated other comprehensive loss were as follows (in thousands):

	Unrealized gain (loss) on available-for-sale-securities	Net unrealized gain (loss) on retirement plan [2]	Change in cumulative foreign currency translation adjustment	Total	Affected line items in the consolidated statements of operations
Balance December 31, 2017, net of tax	$ (258)	$ (11,169)	$ (37)	$(11,464)	
Other comprehensive gain (loss) before reclassification	54	—	20	74	
Reclassification to net income [1]	—	422	—	422	Selling, general and administrative, research and development, and cost of sales
Change during period	54	422	20	496	
Balance March 31, 2018, net of tax	$ (204)	$ (10,747)	$ (17)	$(10,968)	

	Unrealized gain (loss) on available-for-sale-securities	Net unrealized gain (loss) on retirement plan [2]	Change in cumulative foreign currency translation adjustment	Total	Affected line items in the consolidated statements of operations
Balance December 31, 2016, net of tax	$ (246)	$ (10,355)	$ (65)	$(10,666)	
Other comprehensive (loss) gain before reclassification	(15)	—	30	15	
Reclassification to net income [1]	—	299	—	299	Selling, general and administrative, research and development, and cost of sales
Change during period	(15)	299	30	314	
Balance March 31, 2017, net of tax	$ (261)	$ (10,056)	$ (35)	$(10,352)	

(1) The Company reclassified amortization of prior service cost and actuarial loss for its retirement plan from accumulated other comprehensive loss to net income of $422,000 and $299,000 for the three months ended March 31, 2018 and 2017, respectively.
(2) Refer to Note 12: Supplemental Executive Retirement Plan.

11. STOCK-BASED COMPENSATION:

The Company recognizes in the statements of income the grant-date fair value of equity based awards, such as shares issued under employee stock purchase plans, restricted stock awards, restricted stock units and performance unit awards issued to employees and directors.

The grant-date fair value of stock awards is based on the closing price of the stock on the date of grant. The fair value of share-based awards is recognized as compensation expense on a straight-line basis over the requisite service period, net of forfeitures. The Company issues new shares upon the respective grant, exercise or vesting of share-based payment awards, as applicable.

Performance unit awards are subject to either a performance-based or market-based vesting requirement. For performance-based vesting, the grant-date fair value of the award, based on fair value of the Company's common stock, is recognized over the service period based on an assessment of the likelihood that the applicable performance goals will be achieved, and compensation expense is periodically adjusted based on actual and expected performance. Compensation expense for performance unit awards with market-based vesting is calculated based on the estimated fair value as of the grant date utilizing a Monte Carlo simulation model and is recognized over the service period on a straight-line basis.

Equity Compensation Plan

The Equity Compensation Plan provides for the granting of incentive and nonqualified stock options, shares of common stock, stock appreciation rights and performance units to employees, directors and consultants of the Company. Stock options are exercisable over periods determined by the Compensation Committee, but for no longer than 10 years from the grant date. Through March 31, 2018, the Company’s shareholders have approved increases in the number of shares reserved for issuance under the Equity

Compensation Plan to 10,500,000, and have extended the term of the plan through 2024. As of March 31, 2018, there were 2,417,582 shares that remained available to be granted under the Equity Compensation Plan.

Stock Awards

Restricted Stock Awards and Units

The Company has issued restricted stock awards and units to employees and non-employees with vesting terms of one to six years. The fair value is equal to the market price of the Company's common stock on the date of grant for awards granted to employees and equal to the market price at the end of the reporting period for unvested non-employee awards or upon the date of vesting for vested non-employee awards. Expense for restricted stock awards and units is amortized ratably over the vesting period for the awards issued to employees and using a graded vesting method for the awards issued to non-employees.

During the three months ended March 31, 2018, the Company granted 38,142 shares of restricted stock awards and restricted stock units to employees and non-employees, which had a total fair value of $4.6 million on the respective dates of grant, and will vest over three to five years from the date of grant, provided that the grantee is still an employee of the Company or is still providing services to the Company on the applicable vesting date.

For the three months ended March 31, 2018 and 2017, the Company recorded, as compensation charges related to all restricted stock awards and units to employees and non-employees, selling, general and administrative expense of $1.6 million and $2.0 million, respectively, research and development expense of $426,000 and $367,000, respectively, and cost of sales of $160,000 and $94,000, respectively.

In connection with the vesting of restricted stock awards and units during the three months ended March 31, 2018 and 2017, 27,273 and 30,713 shares, with aggregate fair values of $3.4 million and $2.6 million, respectively, were withheld in satisfaction of tax withholding obligations.

For the three months ended March 31, 2018 and 2017, the Company recorded as compensation charges related to all restricted stock units to non-employee members of the Scientific Advisory Board, research and development expense of $157,000 and $271,000, respectively.

Board of Directors Compensation

The Company has granted restricted stock units to non-employee members of the Board of Directors with quarterly vesting over a period of approximately one year. The fair value is equal to the market price of the Company's common stock on the date of grant. The restricted stock units are issued and expense is recognized ratably over the vesting period. For the three months ended March 31, 2018 and 2017, the Company recorded compensation charges for services performed, related to all restricted stock units granted to non-employee members of the Board of Directors, selling, general and administrative expense of $1.1 million and $439,000, respectively. In connection with the vesting of the restricted stock, the Company issued 6,250 and 7,500 shares, during the three months ended March 31, 2018 and 2017, respectively, to non-employee members of the Board of Directors.

Performance Unit Awards

During the three months ended March 31, 2018, the Company granted 12,047 performance units, of which 6,022 are subject to a performance-based vesting and 6,025 are subject to a market-based vesting requirement and will vest over the terms described below. Total fair value of the performance unit awards granted was $1.4 million on the date of grant.

Each performance unit award is subject to both a performance-vesting requirement (either performance-based or market-based) and a service-vesting requirement.

The performance-based vesting requirement is tied to the Company's cumulative revenue growth compared to the cumulative revenue growth of companies comprising the Nasdaq Electronics Components Index, as measured over a specific performance period. The market-based vesting requirement is tied to the Company's total shareholder return relative to the total shareholder return of companies comprising the Nasdaq Electronics Components Index, as measured over a specific performance period.

The maximum number of performance units that may vest based on performance is two times the shares granted. Further, if the Company's total shareholder return is negative, the performance units may not vest at all.

For the three months ended March 31, 2018 and 2017, the Company recorded general and administrative expense of $425,000 and $440,000, respectively, research and development expense of $105,000 and $115,000, respectively, and cost of sales of $44,000 and $45,000, respectively, related to performance units.

In connection with the vesting of performance units during the three months ended March 31, 2018 and 2017, 25,208 and 10,959 shares with an aggregate fair value of $2.9 million and $913,000, respectively, were withheld in satisfaction of tax withholding obligations.

Employee Stock Purchase Plan

On April 7, 2009, the Board of Directors of the Company adopted an Employee Stock Purchase Plan (ESPP). The ESPP was approved by the Company's shareholders and became effective on June 25, 2009. The Company has reserved 1,000,000 shares of common stock for issuance under the ESPP. Unless terminated by the Board of Directors, the ESPP will expire when all reserved shares have been issued.

Eligible employees may elect to contribute to the ESPP through payroll deductions during consecutive three-month purchase periods. Each employee who elects to participate will be deemed to have been granted an option to purchase shares of the Company's common stock on the first day of the purchase period. Unless the employee opts out during the purchase period, the option will automatically be exercised on the last day of the period, which is the purchase date, based on the employee's accumulated contributions to the ESPP. The purchase price will equal 85% of the lesser of the closing price per share of common stock on the first day of the period or the last business day of the period.

Employees may allocate up to 10% of their base compensation to purchase shares of common stock under the ESPP; however, each employee may purchase no more than 12,500 shares on a given purchase date, and no employee may purchase more than $25,000 of common stock under the ESPP during a given calendar year.

During the three months ended March 31, 2018 and 2017, the Company issued 2,345 and 3,330 shares, respectively, of its common stock under the ESPP, resulting in proceeds of $201,000 and $159,000, respectively.

For the three months ended March 31, 2018 and 2017, the Company recorded charges of $17,000 and $15,000, respectively, to selling, general and administrative expense, $22,000 and $25,000, respectively, to research and development expense, and $13,000 and $5,000, respectively, to cost sales related to the ESPP equal to the amount of the discount and the value of the look-back feature.

12. SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN:

On March 18, 2010, the Compensation Committee and the Board of Directors of the Company approved and adopted the Universal Display Corporation Supplemental Executive Retirement Plan (SERP), effective as of April 1, 2010. On March 3, 2015, the Compensation Committee and the Board of Directors amended the SERP to include salary and bonus as part of the plan. Prior to this amendment, the SERP benefit did not take into account any bonuses. This change increased the liability for certain participants in the SERP. The purpose of the SERP, which is unfunded, is to provide certain of the Company's key employees with supplemental retirement benefits following a cessation of their employment and to encourage their continued employment with the Company. As of March 31, 2018, there were seven participants in the SERP.

The Company records amounts relating to the SERP based on calculations that incorporate various actuarial and other assumptions, including discount rates, rate of compensation increases, retirement dates and life expectancies. The net periodic costs are recognized as employees render the services necessary to earn the SERP benefits.

The components of net periodic pension cost were as follows (in thousands):

	Three Months Ended March 31,	
	2018	2017
Service cost	$325	$301
Interest cost	262	242
Amortization of prior service cost	421	415
Amortization of loss	118	47
Total net periodic benefit cost	$1,126	$1,005

13. COMMITMENTS AND CONTINGENCIES:
Commitments

Under the 2006 Research Agreement with USC, the Company is obligated to make certain payments to USC based on work performed by USC under that agreement, and by Michigan under its subcontractor agreement with USC. See Note 7 for further explanation.

Under the terms of the 1997 Amended License Agreement, the Company is required to make minimum royalty payments to Princeton. See Note 7 for further explanation.

The Company has agreements with six executive officers and one employee which provide for certain cash and other benefits upon termination of employment of the officer in connection with a change in control of the Company. If the executive's employment is terminated in connection with the change in control, the executive is entitled to a lump-sum cash payment equal to two times the sum of the average annual base salary and bonus of the officer and immediate vesting of all stock options and other equity awards that may be outstanding at the date of the change in control, among other items.

In order to manage manufacturing lead times and help ensure adequate material supply, the Company entered into an OLED Materials Agreement (see Note 8) that allows PPG Industries to procure and produce inventory based upon criteria as defined by the Company. These purchase commitments consist of firm, noncancelable and unconditional commitments. In certain instances, this agreement allows the Company the option to reschedule and adjust the Company's requirements based on its business needs prior to firm orders being placed. As of March 31, 2018 and December 31, 2017, the Company had purchase commitments for inventory of $17.1 million and $14.2 million, respectively.

Patent Related Challenges and Oppositions

Each major jurisdiction in the world that issues patents provides both third parties and applicants an opportunity to seek a further review of an issued patent. The process for requesting and considering such reviews is specific to the jurisdiction that issued the patent in question, and generally does not provide for claims of monetary damages or a review of specific claims of infringement. The conclusions made by the reviewing administrative bodies tend to be appealable and generally are limited in scope and applicability to the specific claims and jurisdiction in question.

The Company believes that opposition proceedings are frequently commenced in the ordinary course of business by third parties who may believe that one or more claims in a patent do not comply with the technical or legal requirements of the specific jurisdiction in which the patent was issued. The Company views these proceedings as reflective of its goal of obtaining the broadest legally permissible patent coverage permitted in each jurisdiction. Once a proceeding is initiated, as a general matter, the issued patent continues to be presumed valid until the jurisdiction's applicable administrative body issues a final non-appealable decision. Depending on the jurisdiction, the outcome of these proceedings could include affirmation, denial or modification of some or all of the originally issued claims. The Company believes that as OLED technology becomes more established and its patent portfolio increases in size, so will the number of these proceedings.

Below are summaries of certain active proceedings that have been commenced against issued patents that are either exclusively licensed to the Company or which are now assigned to the Company. The Company does not believe that the confirmation, loss or modification of the Company's rights in any individual claim or set of claims that are the subject of the following legal proceedings would have a material impact on the Company's materials sales or licensing business or on the Company's consolidated financial statements, including its consolidated statements of income, as a whole. However, as noted within the descriptions, some of the following proceedings involve issued patents that relate to the Company’s fundamental phosphorescent OLED technologies and the Company intends to vigorously defend against claims that, in the Company’s opinion, seek to restrict or reduce the scope of the originally issued claim, which may require the expenditure of significant amounts of the Company’s resources. In certain circumstances, when permitted, the Company may also utilize the proceedings to request modification of the claims to better distinguish the patented invention from any newly identified prior art and/or improve the claim scope of the patent relative to commercially important categories of the invention. The entries marked with an "*" relate to the Company’s UniversalPHOLED® phosphorescent OLED technology, some of which may be commercialized by the Company.

Opposition to European Patent No. 1394870*

On April 20, 2010, Merck Patent GmbH; BASF Schweitz AG of Basel, Switzerland; Osram GmbH of Munich, Germany; Siemens Aktiengesellschaft of Munich, Germany; and Koninklijke Philips Electronics N.V., of Eindhoven, The Netherlands filed Notices of Opposition to European Patent No.1394870 (the EP '870 patent). The EP '870 patent, which was issued on July 22, 2009, is a European counterpart patent, in part, to U.S. patents 6,303,238; 6,579,632; 6,872,477; 7,279,235; 7,279,237; 7,488,542; 7,563,519;

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and 7,901,795; and to pending U.S. patent application 13/035,051, filed on February 25, 2011 (hereinafter the “U.S. '238 Patent Family”). They are exclusively licensed to the Company by Princeton, and the Company is required to pay all legal costs and fees associated with this proceeding.

An Oral Hearing was held before a European Patent Office (EPO) panel of first instance in Munich, Germany, on April 8-9, 2014. The panel rejected the original claims and amended the claims to comply with EPO requirements by more narrowly defining the scope of the claims. The '870 patent, in its amended form, was held by the panel to comply with the EPO requirements. The Company appealed the ruling to reinstate a broader set of claims. Subsequent to the filing of the appeal, BASF withdrew its opposition to the patent. A hearing on the merits of the appeal was held in the first quarter of 2018, and the ‘870 patent, in its amended form, was held by the panel to comply with the EPO requirements. A written opinion confirming the holding was subsequently issued by the board, thereby closing the opposition proceedings to any further challenges or changes.

Opposition to European Patent No. 1390962

On November 16, 2011, Osram AG and BASF SE each filed a Notice of Opposition to European Patent No. 1390962 (EP '962 patent), which relates to the Company’s white phosphorescent OLED technology. The EP '962 patent, which was issued on February 16, 2011, is a European counterpart patent to U.S. patents 7,009,338 and 7,285,907. They are exclusively licensed to the Company by Princeton, and the Company is required to pay all legal costs and fees associated with this proceeding.

The EPO combined the oppositions into a single opposition proceeding, and a hearing on this matter was held in December 2015, wherein the EPO Opposition Division revoked the patent claims for alleged insufficiencies under EPC Article 83. The Company believes the EPO's decision relating to the original claims is erroneous, and has appealed the decision. Subsequent to the filing of the appeal, BASF withdrew its opposition to the patent. The patent, as originally granted, is deemed valid during the pendency of the appeals process.

At this time, based on its current knowledge, the Company believes that the patent being challenged should be declared valid, and that all or a significant portion of the Company's claims should be upheld. However, the Company cannot make any assurances of this result.

Opposition to European Patent No. 1933395*

On February 24 and 27, 2012, Sumitomo, Merck Patent GmbH and BASF SE filed oppositions to the Company's European Patent No. 1933395 (the EP '395 patent). The EP ‘395 patent is a counterpart to the EP ‘637 patent, and, in part, to U.S. Patents 7,001,536, 6,902,830, and 6,830,828, and to JP patents 4358168 and 4357781. This patent is exclusively licensed to the Company by Princeton, and the Company is required to pay all legal costs and fees associated with this proceeding.

At an Oral Hearing on October 14, 2013, the EPO panel issued a decision that affirmed the basic invention and broad patent coverage in the EP '395 patent, but narrowed the scope of the original claims.

On February 26, 2014, the Company appealed the ruling to reinstate a broader set of claims. The patent, as originally granted by the EPO, is deemed to be valid during the pendency of an appeals process. Two of the three opponents also filed their own appeals of the ruling. In January 2015, Sumitomo withdrew its opposition of the '395 patent, and the EPO accepted the withdrawal notice. The appeal proceedings were held in the second quarter of 2016. As a result of the proceedings, the board concluded the oral proceedings and proposed to reinstate a broader set of claims pending the resolution of a remaining question of the applicable law, a question that the board has deferred to the Enlarged Board of Appeals for review. In December 2017, the Enlarged Board of Appeals issued a written opinion in which it generally followed the Company's reasoning regarding the question of law. The Company expects the written opinion to be used as guidance by the EPO opposition panel when the oral proceedings are rescheduled. The originally-granted claims remain in force during the pendency of this process.

In addition to the above proceedings and now concluded proceedings which have been referenced in prior filings, from time to time, the Company may have other proceedings that are pending which relate to patents the Company acquired as part of the Fujifilm patent or BASF OLED patent acquisitions or which relate to technologies that are not currently widely utilized in the marketplace.

14. CONCENTRATION OF RISK:

Revenues and accounts receivable from the Company's largest customers (individually representing greater that 10% of revenues) were as follows (in thousands):

	% of Revenues for the three months ended		
	March 31,		Accounts Receivable as of
Customer	2018	2017	March 31, 2018
A	55%	35%	$ 10,634
B	16%	51%	$ 3,560
C	11%	3%	$ 2,663

Revenues from outside of North America represented approximately 94% of consolidated revenue for both three month periods ended March 31, 2018 and 2017, respectively. Revenues by geographic area are as follows (in thousands):

	Three Months Ended March 31,	
Country	2018	2017
South Korea	$ 30,774	$ 47,928
China	8,852	2,482
Japan	875	1,084
Other non-U.S. locations	561	712
Total non-U.S. locations	$ 41,062	$ 52,206
United States	2,510	3,360
Total revenue	$ 43,572	$ 55,566

The Company attributes revenue to different geographic areas on the basis of the location of the customer.

Long-lived assets (net), by geographic area are as follows (in thousands):

	March 31, 2018	December 31, 2017
United States	$ 55,777	$ 53,991
Other	2,651	2,459
Total long-lived assets	$ 58,428	$ 56,450

Substantially all chemical materials were purchased from one supplier. See Note 8.

15. INCOME TAXES:

The Company is subject to income taxes in both the United States and foreign jurisdictions. The effective income tax rate was a benefit of 3.8% and an expense of 18.5% for the three months ended March 31, 2018 and 2017, respectively, and the Company recorded an income tax benefit of $216,000 and income tax expense of $2.3 million, respectively. The recorded amounts include deductions for employee share awards in excess of compensation costs ("windfalls") under ASU No. 2016-09 of $1.3 million and $1.2 million for the three months ended March 31, 2018 and 2017, respectively.

In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent on the Company's ability to generate future taxable income to obtain benefit from the reversal of temporary differences, net operating loss carryforwards and tax credits. As part of its assessment management considers the scheduled reversal of deferred tax liabilities, projected future taxable income, and tax planning strategies. At this time there is no evidence to release the valuation allowances that relate to UDC Ireland and New Jersey research and development credit.

16. REVENUE RECOGNITION:

Adoption of ASC Topic 606, "Revenue from Contracts with Customers"

The Company adopted the standard beginning January 1, 2018 using the "modified retrospective" approach, meaning the standard was applied only to the most current period presented in the financial statements, with a cumulative adjustment to retained earnings. Under this transition method, the Company elected to apply ASC Topic 606 only to contracts that are not complete at the initial adoption date.

The new standard impacts how the Company recognizes revenue on its commercial license and material supply agreements with customers. Previously, the Company recognized license fees on a straight-line basis or as received from the customer, and royalty revenue one quarter in arrears based on sales information received from its customers typically received after disclosing that quarter's results. Under the new standard, total contract consideration is estimated and recognized over the contract term based on material units sold at its estimated per unit fee. Total contract consideration includes fixed amounts designated in contracts with customers as license fees as well as estimates of material fees and royalties to be earned.

Adoption of the new standard resulted in an increase in deferred revenue of $21.3 million offset by a reduction of retained earnings of $17.9 million, net of tax of $3.1 million, and unbilled receivables of $0.3 million as of January 1, 2018. The impact of the new standard to revenue for the three months ended March 31, 2018 was a decrease of $24.7 million from the amount that would have been reported under the prior accounting standard. The following tables summarize the impacts of adopting Topic 606 on the Company's consolidated financial statements for the three months ended March 31, 2018.

i. Consolidated balance sheet	Impact of changes in accounting policies		
March 31, 2018 (in thousands)	As reported	Adjustment	Balances without adoption of Topic 606
ASSETS			
Other assets (current and non-current)	$16,692	$ (1,401)	$15,291
Deferred income taxes	29,944	(7,790)	22,154
TOTAL ASSETS	795,140	(9,191)	785,949
LIABILITIES AND SHAREHOLDERS' EQUITY			
Deferred revenue (current and non-current)	79,236	(47,054)	32,182
Retained earnings	84,360	37,863	122,223
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	795,140	(9,191)	785,949

ii. Consolidated statements of income	Impact of changes in accounting policies		
For the three-months ended March 31, 2018 (in thousands)	As reported	Adjustment	Balances without adoption of Topic 606
REVENUE	$43,572	$ 24,653	$68,225
GROSS MARGIN	36,114	24,653	60,767
OPERATING INCOME	4,519	24,653	29,172
INCOME BEFORE INCOME TAXES	5,743	24,653	30,396
INCOME TAX BENEFIT (EXPENSE)	216	(4,684)	(4,468)
NET INCOME	5,959	19,969	25,928

iii. Consolidated statements of cash flows	Impact of changes in accounting policies		
For the three-months ended March 31, 2018 (in thousands)	As reported	Adjustment	Balances without adoption of Topic 606
Net income	$5,959	$ 19,969	$25,928
Amortization of deferred revenue	(12,589)	(29,160)	(41,749)
Deferred income tax expense	72	7,790	7,862
Other assets (current and non-current)	(4,202)	1,401	(2,801)
CASH FLOW FROM OPERATING ACTIVITIES	38,815	-	38,815

For the three months ended March 31, 2018 and 2017, the Company recorded 94% and 97% of its revenue from sales of materials and 6% and 3% from the providing of services through Adesis, respectively.

The rights and benefits to the Company’s OLED technology are conveyed to the customer through technology license agreements and material supply agreements. The Company believes that the licenses and materials sold under these combined agreements are not distinct from each other for financial reporting purposes and as such, are accounted for as a single performance obligation. Accordingly, total contract consideration, including material, license and royalty fees, is estimated and recognized over the contract term based on material units sold at the estimated per unit fee over the life of the contract.

Various estimates are relied upon to recognize revenue. The Company estimates total material units to be purchased by its customers over the contract term based on historical trends, industry estimates and its forecast process. Additionally, management estimates the total sales-based royalties based on the estimated net sales revenue of its customers over the contract term. Management is using the expected value method to estimate the material per unit fee.

Contract Balances

The following table provides information about assets and liabilities associated with our contracts from customers (in thousands):

	As of March 31, 2018
Accounts receivable	$22,768
Short-term unbilled receivables	407
Long-term unbilled receivables	1,272
Short-term deferred revenue	59,736
Long-term deferred revenue	19,500

Short-term and long-term unbilled receivables are classified as other current assets and other assets, respectively, on the Consolidated Balance Sheet. The deferred revenue at March 31, 2018 will be recognized as materials are shipped to customers over the remaining contract periods. The significant customer contracts (individually representing greater than 10% of revenue) expire in 2022. As of March 31, 2018, the Company had $6.8 million of backlog associated with committed purchase orders from its customers for phosphorescent emitter material. These orders are anticipated to be fulfilled within the next 90 days.

Significant changes in the unbilled receivables and deferred liabilities balances during the period are as follows (in thousands):

	Three Months Ended March 31, 2018	
	Unbilled Receivables	Deferred Revenue
	Increase (Decrease)	(Increase) Decrease
Balance at December 31, 2017	$70	$(38,883)
Adoption of revenue standard on January 1, 2018	307	(21,307)
Adjusted balance on January 1, 2018	377	(60,190)
Revenue recognized that was previously included in deferred revenue	—	6,490

Increases due to cash received	—	(30,331)
Cumulative catch-up adjustment arising from changes in estimates of transaction price	—	4,795
Unbilled receivables recognized	1,302	—
Transferred to receivables from unbilled receivables	—	—
Net change	1,302	(19,046)
Balance at March 31, 2018	$ 1,679	$ (79,236)

17. NET INCOME PER COMMON SHARE:

The Company computes earnings per share in accordance with ASC Topic 260, Earnings per Share ("ASC 260"), which requires earnings per share for each class of stock to be calculated using the two-class method. The two-class method is an allocation of income between the holders of common stock and the Company's participating security holders. Under the two-class method, income for the reporting period is allocated between common shareholders and other security holders based on their respective participation rights in undistributed income. Unvested share-based payment awards that contain non-forfeitable rights to dividends or dividend equivalents are participating securities and, therefore, are included in computing earnings per share pursuant to the two-class method.

Basic net income per common share is computed by dividing net income allocated to common shareholders by the weighted-average number of shares of common stock outstanding for the period excluding unvested restricted stock units and performance units. Net income allocated to the holders of the Company's unvested restricted stock awards is calculated based on the shareholder’s proportionate share of weighted average shares of common stock outstanding on an if-converted basis.

For purposes of determining diluted net income per common share, basic net income per share is further adjusted to include the effect of potential dilutive common shares outstanding, including stock options, restricted stock units and performance units, and the impact of shares to be issued under the ESPP.

The following table is a reconciliation of net income and the shares used in calculating basic and diluted net income per common share for the three months ended March 31, 2018 and 2017 (in thousands, except share and per share data):

	Three Months Ended March 31,	
	2018	2017
Numerator:		
Net income	$5,959	$10,365
Adjustment for Basic EPS:		
Earning allocated to unvested shareholders	(87)	(191)
Adjusted net income	$5,872	$10,174
Denominator:		
Weighted average common shares outstanding – Basic	46,783,158	46,661,559
Effect of dilutive shares:		
Common stock equivalents arising from stock options and ESPP	837	2,151
Restricted stock awards and units and performance units	64,803	79,184
Weighted average common shares outstanding – Diluted	46,848,798	46,742,894
Net income per common share:		
Basic	$0.13	$0.22
Diluted	$0.13	$0.22

For the three months ended March 31, 2018 and 2017, there were zero and 2,108 unvested restricted stock awards, restricted stock units, performance unit awards and stock options excluded from the calculation of diluted EPS as their impact would have been antidilutive. The impact of shares to be issued under the ESPP, which was not significant, was excluded from the calculation of diluted EPS as their impact would have been antidilutive.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with the consolidated financial statements and related notes above.

CAUTIONARY STATEMENT

CONCERNING FORWARD-LOOKING STATEMENTS

This discussion and analysis contains some “forward-looking statements.” Forward-looking statements concern possible or assumed future results of operations, including descriptions of our business strategies and customer relationships. These statements often include words such as “believe,” “expect,” “anticipate,” “intend,” “plan,” “estimate,” “seek,” “will,” “m similar expressions. These statements are based on assumptions that we have made in light of our experience in the industry, as well as our perceptions of historical trends, current conditions, expected future developments and other factors that we believe are appropriate in these circumstances.

As you read and consider this discussion and analysis, you should not place undue reliance on any forward-looking statements. You should understand that these statements involve substantial risk and uncertainty and are not guarantees of future performance or results. They depend on many factors that are discussed further in the section entitled (Risk Factors) in our Annual Report on Form 10-K for the year ended December 31, 2017, as supplemented by disclosures, if any, in Item 1A of Part II below. Changes or developments in any of these areas could affect our financial results or results of operations and could cause actual results to differ materially from those contemplated in the forward-looking statements.

All forward-looking statements speak only as of the date of this report or the documents incorporated by reference, as the case may be. We do not undertake any duty to update any of these forward-looking statements to reflect events or circumstances after the date of this report or to reflect the occurrence of unanticipated events.

OVERVIEW

We are a leader in the research, development and commercialization of organic light emitting diode, or OLED, technologies and materials for use in displays for mobile phones, televisions, tablets, wearables, portable media devices, notebook computers, personal computers and automotive applications, as well as specialty and general lighting products. Since 1994, we have been exclusively engaged, and expect to continue to be primarily engaged, in funding and performing research and development activities relating to OLED technologies and materials, and commercializing these technologies and materials. We derive our revenue primarily from the following:

- sales of OLED materials for evaluation, development and commercial manufacturing;
- intellectual property and technology licensing;
- contract research services, and
- technology development and support, including government contract work and support provided to third parties for commercialization of their OLED products.

Material sales relate to our sale of OLED materials for incorporation into our customers' commercial OLED products or for their OLED development and evaluation activities. Material sales are recognized at the time title passes, which is typically at the time of shipment or at the time of delivery, depending upon the contractual agreement between the parties.

We receive license and royalty payments under certain commercial, development and technology evaluation agreements, some of which are non-refundable advances. These payments may include royalty and license fees made pursuant to license agreements and also license fees included as part of certain commercial supply agreements. These payments are included in the estimate of total contract consideration by customer and recognized as revenue over the contract term based on material units sold at the estimated per unit fee over the life of the contract.

Our most significant commercial license agreement is with Samsung Display Co., Ltd. (SDC) covering the manufacture and sale of specified OLED display products. The agreement, originally entered into in 2011, expired at the end of 2017 and has been replaced with a new five year license agreement with a two-year extension option.

At the same time we entered into the 2011 patent license agreement with SDC, we also entered into a supplemental material purchase agreement with SDC which also expired in 2017 and was also replaced with a new five-year supply agreement with a two-year extension option.

In 2015, we entered into an OLED patent license agreement and an OLED commercial supply agreement with LG Display Co., Ltd. (LG Display), which were effective as of January 1, 2015 and superseded the existing 2007 commercial supply agreement between the parties. The new agreements have a term that is set to expire by the end of 2022. The patent license agreement provides LG Display a non-exclusive, royalty bearing portfolio license to make and sell OLED displays under the Company's patent portfolio. The patent license calls for license fees, prepaid royalties and running royalties on licensed products. The agreements include customary provisions relating to warranties, indemnities, confidentiality, assignability and business terms. The agreements provide for certain other minimum obligations relating to the volume of material sales anticipated over the term of the agreements as well as minimum royalty revenue to be generated under the patent license agreement. The Company expects to generate revenue under these agreements that are predominantly tied to LG Display's sales of OLED licensed products. The OLED commercial supply agreement provides for the sales of materials for use by LG Display, which may include phosphorescent emitters and host materials.

In 2017, we entered into long-term, multi-year agreements with BOE Technology Group Co., Ltd. (BOE). Under these agreements, we have granted BOE non-exclusive license rights under various patents owned or controlled by us to manufacture and sell OLED display products. We have also agreed to supply phosphorescent OLED materials to BOE.

In 2016, we entered into OLED patent license and material purchase agreements having five year durations with Tianma Micro-electronics Co. Ltd. (Tianma). Under the license agreement, we have granted Tianma non-exclusive license rights under various patents owned or controlled by us to manufacture and sell OLED display products. The license agreement calls for license fees and running royalties on licensed products. Additionally, we expect to supply phosphorescent OLED materials to Tianma for use in its licensed products.

In 2016, we acquired Adesis, Inc. (Adesis) with operations in New Castle, Delaware. Adesis is a contract research organization (CRO) that provides support services to the OLED, pharma, biotech, catalysis and other industries. As of December 31, 2017, Adesis employed a team of 50 chemists. Prior to our acquisition in 2016, we utilized more than 50% of Adesis' technology service and production output. We continue to utilize a significant portion of its technology research capacity for the benefit of our OLED technology development, and Adesis uses the remaining capacity to operate as a CRO in the above-mentioned industries providing contract research services to those third party customers. Contract research services revenue is earned by performing organic and organometallic synthetics research, development and commercialization on a contractual basis for our customers.

We also generate technology development and support revenue earned from government contracts, development and technology evaluation agreements and commercialization assistance fees, which include reimbursements by government entities for all or a portion of the research and development costs we incur in relation to our government contracts. Revenues are recognized as services are performed, proportionally as research and development costs are incurred, or as defined milestones are achieved.

We anticipate fluctuations in our annual and quarterly results of operations due to uncertainty regarding, among other factors:

- the timing, cost and volume of sales of our OLED materials;
- the timing of our receipt of license fees and royalties, as well as fees for future technology development and evaluation;

- the timing and magnitude of expenditures we may incur in connection with our ongoing research and development and patent-related activities; and
- the timing and financial consequences of our formation of new business relationships and alliances.

RESULTS OF OPERATIONS

Comparison of the Three Months Ended March 31, 2018 and 2017

	Three Months Ended March 31,		
	2018	2017	Increase (Decrease)
REVENUE	$43,572	$55,566	$ (11,994)
COST OF SALES	7,458	12,987	(5,529)
Gross margin	36,114	42,579	(6,465)
OPERATING EXPENSES:			
Research and development	12,357	11,818	539
Selling, general and administrative	10,791	10,077	714
Amortization of acquired technology and other intangible assets	5,491	5,492	(1)
Patent costs	1,725	1,547	178
Royalty and license expense	1,231	1,587	(356)
Total operating expenses	31,595	30,521	1,074
OPERATING INCOME	4,519	12,058	(7,539)
Interest income, net	1,271	671	600
Other expense, net	(47)	(19)	(28)
Interest and other expense, net	1,224		