

Rubicon Technology, Inc.
Form 10-K
March 20, 2018

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, DC 20549

FORM 10-K

(Mark one)

Annual report pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934 for the fiscal year ended December 31, 2017

or

Transition report pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934 for the transition period from _____ to _____

Commission file number 001-33834

RUBICON TECHNOLOGY, INC.

(Exact Name of Registrant as Specified in Its Charter)

| | |
|---|--|
| Delaware (State or Other Jurisdiction of | 36-4419301 (I.R.S. Employer |
| Incorporation or Organization) | Identification No.) |
| 900 East Green Street | 60106 |
| Bensenville, Illinois (Address of Principal Executive Offices) | (Zip Code) |

Registrant's Telephone Number, Including Area Code: (847) 295-7000

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

| Title of each class | Name of each exchange on which registered |
|--|--|
| Common Stock, Par Value \$0.001 per share | The NASDAQ Capital Market |

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes No

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

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Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, 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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K

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

| | |
|---|---------------------------|
| Large accelerated filer | Accelerated filer |
| Non-accelerated filer (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 accounting standards provided pursuant to Section 13(a) of the Exchange Act.

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

As of June 30, 2017, there were 2,361,038 shares of common stock outstanding held by non-affiliates of the registrant, with an aggregate market value of the common stock (based upon the closing price of these shares on the NASDAQ Capital Market) of approximately \$21,863,210.

The number of shares of the registrant's common stock outstanding as of the close of business on March 5, 2018 was 2,737,813.

Documents incorporated by reference:

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Portions of the Registrant's Proxy Statement for its 2018 Annual Meeting of Stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K provided, that if such Proxy Statement is not filed with the Commission within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed no later than the end of such 120-day period.

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PART I

All statements, other than statements of historical facts, included in this Annual Report on Form 10-K including statements regarding our estimates, expectations, beliefs, intentions, projections or strategies for the future, results of operations, financial position, net sales, projected costs, prospects and plans and objectives of management for future operations may be “forward-looking statements” within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. We have based these forward-looking statements on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives and financial needs. These forward-looking statements can be identified by the use of terms and phrases such as “believe,” “plan,” “intend,” “anticipate,” “target,” “estimate,” “expect,” “forecast,” “prospects,” “goals,” “potential,” “likely,” and the like, future-tense or conditional constructions such as “will,” “may,” “could,” “should,” etc. (or the negative thereof). Items contemplating or making assumptions about actual or potential future sales, market size and trends or operating results also constitute forward-looking statements.

Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. Before investing in our common stock, investors should be aware that the occurrence of the risks, uncertainties and events described in the section entitled “Risk Factors” and elsewhere in this Annual Report could have a material adverse effect on our business, results of operations and financial condition. These risks and uncertainties include the adoption of sapphire as a material in new applications, our successful development and the market’s acceptance of new products; our ability to sell certain assets, including those in Malaysia and underutilized assets in the U.S., and the prices we receive therefor; our ability to make effective acquisitions and successfully integrate newly acquired businesses into existing operations; our ability to effectively utilize net loss carryforwards; dependence on key customers; our ability to secure new business and retain customers; changes in demand or the average selling prices of sapphire products; the failure to achieve the margins we expect, whether due to our own operations or changes in the market for our products; our ability to successfully qualify our products with customers and potential customers; potential disruptions in our supply of electricity; changes in our product mix; the outcome of the testing of new products and processes or the testing of our existing products for new applications; the failure of third parties performing services for us to do so successfully; our ability to protect our intellectual property rights; the competitive environment; and the cost of compliance with environmental standards. Although we believe that the expectations reflected in the forward-looking statements are reasonable, forward-looking statements are inherently subject to known and unknown risks, including business, economic and other risks and uncertainties that may cause actual results to be materially different from those discussed in these forward-looking statements. Readers are urged not to place undue reliance on these forward-looking statements, which speak only as of the date of this Annual Report. We assume no obligation to update any forward-looking statements in order to reflect any event or circumstance that may arise after the date of this Annual Report, other than as may be required by applicable law or regulation. If one or more of these risks or uncertainties materialize, or if the underlying assumptions prove incorrect, our actual results may vary materially from those expected or projected.

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You should read this Annual Report and the documents that we reference in this Annual Report and have filed with the Securities and Exchange Commission (the “SEC”) as exhibits with the understanding that our actual future results, levels of activity, performance and events and circumstances may be materially different from what we expect.

Unless otherwise indicated, the terms “Rubicon,” the “Company,” “we,” “us,” and “our” refer to Rubicon Technology, Inc. and our consolidated subsidiaries.

ITEM 1. BUSINESS OVERVIEW

We are a vertically integrated, advanced materials provider specializing in monocrystalline sapphire for applications in optical and industrial systems. We design, assemble and maintain our own proprietary crystal growth furnaces to grow high-purity, low-stress, ultra-low-defect-density sapphire crystals. We apply our proprietary crystal growth technology to produce high-quality sapphire products to meet our customers exacting specifications. Sapphire is a desirable material for high-performance applications due to its hardness and strength, transparency in the visible and IR spectrum, thermal conductivity, thermal shock resistance, abrasion resistance, high melting point and chemical inertness. As a result, it is ideally suited for extreme environments in a range of industries where material durability is just as important as optical clarity.

Historically, we have also provided sapphire products to the LED and mobile device markets, which are the largest markets for sapphire. However, given competitive pressures in those markets, in September 2016 we announced our decision to limit our focus in the near-term on the optical and industrial sapphire markets and exit the LED market. We believe that we continue to have a reputation as one of the highest quality sapphire producers in the market. We provide optical and industrial sapphire products in various shapes and sizes, including round and rectangular windows and blanks, domes, tubes and rods.

With the decision to exit the LED market, in November 2016 we stopped our production activities located in Penang, Malaysia and subsequently closed this facility. Our wafer patterning equipment located in Malaysia was sold in the fourth quarter of 2016 for \$4.5 million. We held an auction in March 2017 in an effort to sell certain polishing and fabrication equipment with mixed results. Since the March 2017 auction, we have sold some additional equipment and continue to seek buyers for the remaining unsold equipment. Additionally, we are seeking to sell our Malaysia real estate. The timing of the sale of the remaining equipment and real estate located in Malaysia is difficult to predict.

Following the decision in the fourth quarter 2016 to focus on smaller optical and industrial sapphire markets, we determined that we had more crystal growth and fabrication capacity in the U.S. than we needed for our current business strategy. Consequently, we have consolidated operations into our leased spaces in Bensenville, Illinois and Franklin Park, Illinois and vacated our owned facility in Batavia, Illinois. In March 2017, we held an auction to sell excess equipment from our Batavia facility. Other than crystal growth furnaces, most of the equipment was sold. The plant itself is a special purpose facility with extensive enhancements to power and water-cooling systems required for crystal growth production.

We are actively trying to sell or lease this property and our initial focus is to find a buyer that is interested in both the building and its improved infrastructure. However, to date we have been unable to find a buyer that values such enhancements and ultimately may be unable to sell this real estate for more than the value of a standard facility. In fact we may be required by a buyer to pay for the removal of the enhancements. The timing on the sale or lease of this real estate and our crystal growth furnaces is difficult to predict.

Historically, we sold sapphire cores into the mobile device market and sapphire cores and wafers into the LED market. With the cessation of our LED-related production activities at our Malaysia facility, our LED revenue ceased. Approximately 91% of our 2017 sales came from optical and industrial sapphire components. The following table summarizes optical revenue for each of the last three years:

| Year ended December 31, | Optical revenue (in thousands) | % of total revenue | |
|--------------------------------|---|-------------------------------|---|
| 2017 | \$ 4,615 | 91 | % |
| 2016 | \$ 4,568 | 23 | % |
| 2015 | \$ 5,086 | 21 | % |

We operate in a very competitive market. Our ability to expand our optical and industrial business and the acceptance of new product offerings is difficult to predict.

In addition, our optical and industrial sapphire business serves smaller markets than our historical undertakings, so we are actively evaluating the acquisition of profitable companies outside of the sapphire market in order to utilize our substantial net tax loss carry-forwards (“NOLs”).

We are a Delaware corporation incorporated on February 7, 2001. Our common stock is listed on the NASDAQ Capital Market under the ticker symbol “RBCN.”

INDUSTRY OVERVIEW

Sapphire is utilized in optical and industrial applications. It is used for windows and optics for aerospace, sensor, medical, semiconductor, instrumentation, electronics and laser applications due to its wide-band transmission, superior strength, chemical and scratch resistance and high strength-to-weight ratio. Sapphire's physical and optical properties also make it very well suited for defense applications such as electro-optical and sensor suite windows for military fighter jets, helicopters, unmanned air vehicles and ships, forward-looking infrared windows for commercial and business aircrafts as well as missile domes, submarine windows and components and transparent armor for military vehicles. We believe that these markets may be growing as new applications for sapphire emerge for larger size and higher quality sapphire components and also due to the availability of more cost effective sapphire part production.

TECHNOLOGY

Our proprietary crystal growth technique, which we refer to as ES2, produces high-quality sapphire crystals for use in our sapphire products. ES2 is derived from the standard Kyropoulos method of crystal growth. We developed this technique with the goal of establishing greater control over the crystal growth process while maintaining minimal temperature variations. Unlike other techniques, during the ES2 technique, the growing sapphire crystal exists in an unconstrained, low stress environment inside a closed growth chamber. The closed system allows for enhanced control of the melt, resulting in higher quality crystals. The temperature gradient between the melt and the crystal in the ES2 technique is significantly lower than in other crystal growth techniques. These aspects of the ES2 technique enable us to grow crystals that have a significantly lower dislocation density, higher crystal purity and greater uniformity than sapphire crystals grown using other techniques. The ES2 technique provides an inherent annealing process once the crystal is fully grown. This thermal annealing is an integral means of relieving stress in the crystal during the ES2 process. We have demonstrated the ability to readily scale our ES2 technology in a production environment while maintaining high crystal quality even as crystal boule size is increased.

Our furnace environments are controlled by closed-loop control systems and the overall crystal growth process is run with minimal operator intervention. A single operator can supervise the control of multiple ES2 furnaces simultaneously, which reduces costs.

We have now completed crystal growth development for our Large Area Net Shaped Crystal Extraction (“LANCE”) technology, which is a technology designed to produce very large, thick sapphire windows. This technology was developed with government funding under a contract with the Air Force Research Laboratory. We have completed the growth of the window blank deliverables on this project, including the largest size sapphire window in the world at 36 x 18 x 0.8 inch dimensions. The project will not be fully completed until our subcontractors complete the polishing of the windows. We will continue to refine the process to improve yield; however, our main focus now is the development of the market for these larger windows. The product has been displayed at trade shows and has attracted interest both from military and industrial product developers.

PRODUCTS

We believe the developing optical and industrial markets require large diameter sapphire products, high quality sapphire and ultra-thin double side polished windows and wafers which may be beyond the capability of many sapphire suppliers. In addition, military and defense applications often require a U.S. based source for sapphire. We believe we continue to have a reputation for producing the highest quality optical-grade sapphire. We also have the ability to maintain that crystal quality in very large sizes, to support a strong and developing U.S. customer base, and to provide very high performance ultra-thin double side polished sapphire products, which we believe positions us well in the optical, laser, and epitaxial growth markets.

We provide optical and industrial sapphire products in various shapes and sizes, including round and rectangular windows and blanks, domes, tubes and rods. These optical sapphire products are qualified and used in equipment for a wide variety of end markets and high performance applications including defense and aerospace, specialty lighting, instrumentation, sensors and detectors, semiconductor process equipment, electronic substrates, medical and laser applications.

We believe we offer the industry’s largest sapphire windows and highest quality, ultra-thin, double side polished windows and substrates. Our product lines include very thin, double-side polished windows as thin as 300 microns for 6” optical diameter substrates, and also very large-area blanks and polished windows. We offer round C-plane sapphire windows up to 11” in diameter and A-plane windows up to 18” in diameter with UV grade windows up to 13.5” in diameter. We also have produced sapphire window blanks at 36” x 18” x 0.8” dimensions.

RESEARCH AND DEVELOPMENT

In 2017 and 2016, our R&D expenses totaled \$962,000 and \$2.5 million, respectively. The scope of R&D projects has been reduced, and we expect R&D expenses to be significantly lower in 2018. These expenses generally do not include costs incurred in connection with our R&D activities under the LANCE government contract. However, in 2017 and 2016 we recorded estimated costs of \$26,000 and \$217,000 in excess of the contract value at December 31, 2017 and 2016, respectively.

Production expenses associated with the LANCE government agreement up to the contract value are accounted for as revenue and cost of goods sold. We record R&D revenue associated with the LANCE government contract as costs are incurred plus a fixed fee. For each of the years ended December 31, 2017 and 2016 revenue from R&D accounted for less than 10% of our revenue. Since 2012, we have recorded \$4.7 million in revenue and the total value of the contract is \$4.7 million. As LANCE is largely complete, we expect our R&D revenue to be less than \$100,000 in 2018.

MANUFACTURING

The process of growing the crystal begins by heating the raw material, aluminum oxide, until it reaches an ideal temperature above its melting point. This ideal temperature is essential for our process because it allows us to produce high-purity crystals with very low defect rates. Following the heating, a seed rod is inserted in the melted material as the material is being cooled to crystallize into a boule. Following the growth process, each boule is rigorously inspected by using polarized lighting and magnification to find imperfections, such as bubbles, dislocations and granular deposits within the crystal.

We then drill the resulting boules into cylindrical cores using our custom high-precision crystal orientation equipment and proprietary processes. For many of our parts, the cores are then finished through an outsourcing model using trusted partners.

We are dedicated to quality assurance throughout our entire operation. We employ detailed material traceability from raw material to finished product. Our quality system is certified as ISO9001:2000.

All of our long-lived assets are located in the U.S. and Malaysia. While there are long-lived assets in Malaysia, we are attempting to sell them, as that facility is shut-down and is not an active part of our operations. For more information see Note 2 – Segment Information to our Consolidated Financial Statements included in this Annual Report on Form 10-K.

SALES AND MARKETING

We market and sell our products through our direct sales force to customers. Our direct sales force includes experienced and technically sophisticated sales professionals and engineers who are knowledgeable in the development, manufacturing and use of sapphire windows and other optical materials. Our sales staff works with customers during all stages of the manufacturing process, from developing the precise composition of the parts through manufacturing and processing the parts to the customers' specifications.

A key component of our marketing strategy is developing and maintaining strong relationships with our customers. We achieve this by working closely with our customers to optimize our products for their production processes. In addition, we are able to develop long-term relationships with key customers by offering product specification assistance, providing direct access to enable them to evaluate and audit our operations, delivering high-quality products and providing superior customer service. We believe that maintaining close relationships with our customers' senior management and providing technical support improves customer satisfaction.

In order to increase brand recognition of our products and our Company in general we publish technical articles, distribute promotional materials and participate in industry trade shows and conferences.

CUSTOMERS

Our principal customers have been defense sub-contractors, industrial manufacturers, fabricators and resellers. A substantial portion of our sales have been to a small number of customers. In 2017 our top customers accounted for in the aggregate approximately 31% of our revenue and in 2016, the top customer accounted for approximately 60% of our revenue. Although we are attempting to diversify and expand our customer base, we expect our sales to continue to be concentrated among a small number of customers. However, we also expect that our significant customers may change from time to time. No other customer accounted for 10% or more of our revenues during 2017 or 2016.

INTELLECTUAL PROPERTY

Our ability to protect our proprietary technologies and other confidential information is a key factor in our ability to compete successfully. We rely primarily upon a combination of patent, trade secret laws and non-disclosure agreements with employees, customers and potential customers to protect our intellectual property. We have six patents issued by the U.S. Patent and Trademark office expiring between 2027 and 2030. In addition, we have an aggregate of seven pending patent applications with the U.S. Patent and Trademark Office and with various other foreign countries. The patents and patent applications mostly cover aspects of our core production, wafer grinding and lapping technologies. However, we believe that factors such as the technological and innovative abilities of our personnel, the success of our ongoing product development efforts and our efforts to maintain trade secret protection are more important than patents in maintaining our competitive position. We pursue the registration of certain of our trademarks in the U.S. and currently have three registered trademarks.

COMPETITION

The markets for high-quality sapphire products are very competitive and have been characterized by rapid technological change. The products we produce must meet certain demanding requirements to succeed in the marketplace. Although we are a well-established sapphire producer, we face significant competition from other established providers of similar products as well as from new and potential entrants into our markets.

We have several competitors that compete directly with us. We believe that the key competitive factors in our markets are:

consistently producing high-quality products in the desired size, orientation and finish;

pricing;

driving innovation through focused research and development efforts;

producing large format high-quality crystal for certain applications;

providing U.S.-based source of sapphire for military applications; and

financial stability of the companies.

We believe the developing optical and industrial markets require cost effective high quality sapphire, large diameter sapphire products and ultra-thin double side polished windows and wafers, which we have the capabilities to provide while certain other sapphire producers may not. In addition, defense applications often require a U.S. based source for sapphire. We believe we continue to have a reputation for producing the highest quality sapphire in the market. We believe this positions us well with competitive advantages in the markets for optical and industrial sapphire.

ENVIRONMENTAL REGULATION

In our manufacturing process, we use water, oils, slurries, acids, adhesives and other industrial chemicals. We are subject to a variety of federal, state and local laws regulating the discharge of these materials into the environment or otherwise relating to the protection of the environment. These include statutory and regulatory provisions under which we are responsible for the management of hazardous materials we use and the disposition of hazardous wastes resulting from our manufacturing processes. Failure to comply with such provisions, whether intentional or inadvertent, could result in fines and other liabilities to the government or third parties, injunctions requiring us to suspend or curtail operations or other remedies, which could have a material adverse effect on our business. The cost of complying with environmental regulation is not material.

EMPLOYEES

As of December 31, 2017, we had 20 full-time employees and one full-time consultant of which 11 full time employees worked in technology and operations. None of our employees are represented by a labor union. We consider our employee relations to be good.

OTHER INFORMATION

You may access, free of charge, our reports filed with the SEC (for example, our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K and any amendments to those forms) over the Internet at the SEC's website at <http://www.sec.gov>. You may also read and copy any document we file at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. Our SEC filings are also available through our Internet website (www.rubicontechnology.com). Reports filed with or furnished to the SEC will be available as soon as reasonably practicable after they are filed with or furnished to the SEC. Alternatively, if you would like a paper copy of any such SEC report (without exhibits) or document, write to Investor Relations, Rubicon Technology, Inc., 900 East Green Street, Bensenville, Illinois 60106, and a copy of such requested document will be provided to you, free of charge. The information found on our website is not part of this or any other report filed with or furnished to the SEC.

ITEM 1A. RISK FACTORS

You should carefully read the risk factors set forth below, together with the financial statements, related notes and other information contained in this Annual Report on Form 10-K. Our business is subject to a number of important risks and uncertainties, some of which are described below. The risks described below, however, are not the only risks that we face. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also impair our business operations. Any of these risks may have a material adverse effect on our business, financial condition, results of operations and cash flows. Please refer to the discussion of “forward-looking statements” on page one of this Annual Report on Form 10-K in connection with your consideration of the risk factors and other important factors that may affect future results described below.

We have incurred significant losses in prior periods and may incur losses in the future.

We have incurred significant losses in prior periods and may continue to incur significant losses for the foreseeable future. These losses may have an adverse effect on our ability to attract new customers or retain existing customers. We have incurred net losses of \$17.9 million, \$62.9 million, \$77.8 million, \$44.0 million, \$30.4 million and \$5.5 million in 2017, 2016, 2015, 2014, 2013 and 2012, respectively. There can be no assurance that we will have sufficient revenue to achieve profitability in future periods.

We are exploring, evaluating and have begun implementing alternatives with a goal of providing greater value to our stockholders. There can be no assurance that we will be successful in identifying additional alternatives or implementing any alternative, or that any alternative will yield additional value for stockholders.

Our management and Board of Directors are continuing to review alternatives with a goal of providing greater value to our stockholders. These alternatives could result in, among other things, modifying or eliminating certain of our operations, selling material assets, seeking additional financing, selling the business, effecting a merger, consolidation or other business combination, partnering or other collaboration agreements, or potential acquisitions or recapitalizations, in one or more transactions. In connection with the Board of Directors’ continuing review of alternatives, on September 12, 2016, the Board of Directors determined to shut down production activities and close our facility in Penang, Malaysia, and to sell our assets relating to the Malaysian operations. Production activities at the Malaysia facility have ceased. Also on September 12, 2016, we announced the Board of Directors’ decision to limit our focus on the optical and industrial sapphire markets and to exit the LED and mobile device markets. There is no assurance that we will be able to successfully expand our optical and industrial sapphire business or that we will obtain market acceptance for any new product offerings in these markets.

During 2017, we sold certain equipment located in the United States and Malaysia and we are continuing our efforts to sell additional excess equipment. There is no assurance that we will be able to sell any additional excess equipment at prices favorable to us, or at all. Our Batavia, Illinois land and facility remains for sale or lease and our Malaysia land and facility remain for sale. There is no assurance that we will be able to sell or lease any land or facilities at prices favorable to us. Additionally, there can be no assurance that our continued exploration of alternatives will result in the identification of additional alternatives or that any transaction will be consummated. The process of exploring alternatives may be costly and may be time consuming, distracting to management and disruptive to our business operations. If we are unable to effectively manage the process, our business, financial condition and results of operations could be adversely affected. We also cannot provide assurance that any potential transaction or other alternative identified, evaluated and consummated, will provide greater value to our stockholders than that reflected in the current stock price. Any potential transaction would be dependent upon a number of factors that may be beyond our control, including, among other factors, market conditions, industry trends and the availability of financing to us on reasonable terms.

We may acquire other businesses, products or technologies; if we do, we may be unable to integrate them with our business effectively or at all, which may adversely affect our business, financial condition and operating results.

If we find appropriate opportunities and have adequate funding, we may acquire other businesses, product lines or technologies. However, if we acquire a business, product line or technology, the process of integration may produce unforeseen operating difficulties and expenditures and may absorb significant attention of our management that would otherwise be available for the ongoing development of our business. Further, the acquisition of a business may result in the assumption of unknown liabilities or create risks with respect to our existing relationships with suppliers and customers. If we make acquisitions, we may issue shares of stock that dilute other stockholders, expend cash, incur debt, assume contingent liabilities or create additional expenses related to amortizing intangible assets, any of which may adversely affect our business, financial condition or operating results.

If we are unable to raise additional capital when needed, we may not be able to execute our business plan or the acquisition of other businesses.

We may require additional capital to fund operations, capital expenditures and the introduction of new products or the acquisition of other businesses. We may finance future cash needs through public or private equity offerings, debt financings, corporate collaborations or licensing arrangements. Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available, we may be required to delay, reduce the scope of or eliminate one or more of our acquisition opportunities. To the extent that we raise additional funds by issuing equity securities, our stockholders may experience dilution, and debt financing, if available, may involve restrictive covenants. To the extent that we raise additional funds through corporate collaborations or licensing arrangements, it may be necessary to relinquish some rights to our technologies or our new products or grant licenses on terms that may not be favorable to us. We may seek to access the public or private capital markets whenever conditions are favorable, even if we do not have an immediate need for additional capital at that time. Introducing newly developed products to the market often requires investment before revenue is generated from those products. We currently have no commitments or arrangements for any additional financing to fund our product research and development programs. However, we may need to raise substantial additional capital in the future to complete the development and commercialization of our new products or to acquire new businesses or technology.

We believe our existing cash, cash equivalents and short-term investments and interest thereon, will be sufficient to fund our projected operating requirements for at least the next twelve months. However, if our success in generating sufficient operating cash flow or our use of cash in the next twelve months were to significantly adversely change, we may not have enough funds available to continue operating at our current level in future periods. A limitation of funds available may raise concerns about our ability to continue to operate. Such concerns may limit our ability to obtain financing and some customers may not be willing to do business with us.

Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

the amount of our revenues and ability to be operationally cash flow positive;

the extent to which we acquire or invest in businesses, products or technologies;

the level of capital expenditures required to maintain or expand our operations;

the initiation, progress, timing, costs and results of studies and trials required for our new products;

the terms and timing of any future collaboration, licensing or other arrangements that we may establish;

the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;

the effect of competing technological and market developments; and

the cost of establishing sales, marketing and distribution capabilities for any new products.

We rely on third parties for certain finishing steps for our products, including the slicing and polishing of our sapphire crystal.

In order to reduce product costs and improve cash flow, we use third parties for certain finishing functions for our products, including the slicing and polishing of our sapphire crystal inventory. These types of services are only available from a limited number of third parties. Our ability to successfully outsource these finishing functions will substantially depend on our ability to develop, maintain and expand our strategic relationship with these third parties. Any impairment in our relationships with the third parties performing these functions, in the absence of a timely and satisfactory alternative arrangement, could have a material adverse effect on our business, results of operations, cash flow and financial condition. In addition, we do not control any of these third parties or the operation of their facilities, and we may not be able to adequately manage and oversee the third parties performing our finishing functions. Accordingly, any difficulties encountered by these third parties that result in product defects, delays or defaults on their contractual commitments to us could adversely affect our business, financial condition and results of operations. In addition, their facilities may be vulnerable to damage or interruption from natural disasters, inclement weather conditions, power loss, acts of terrorism and similar events. A decision to close a facility without adequate notice as a result of these or other unanticipated problems at the facility could result in lengthy interruptions in their services to us; and any loss or interruption of these services could significantly increase our expenses, cause us to default on our obligations to our customers and/or otherwise adversely affect our business. Furthermore, the outsourcing of our finishing steps, such as slicing and polishing of wafers, may not continue to be available at reasonable prices or on commercially reasonable terms, or at all.

Our gross margins could fluctuate as a result of changes in our product mix and other factors, which may adversely impact our operating results.

We anticipate that our gross margins will fluctuate from period to period as a result of the mix of products that we sell in any given period. We are working to increase sales of higher margin products, introduce new differentiated products and lower our costs. There can be no assurance that we will be successful in improving our gross margin mix. If we are not successful, our overall gross margin levels and operating results in future periods would continue to be adversely impacted. Increased competition and the adoption of alternatives to our products, more complex engineering requirements, lower demand and other factors may lead to a further downward shift in our product margins, leading to price erosion and lower revenues for us in the future.

The markets in which we operate are very competitive, and many of our competitors and potential competitors are larger, more established and better capitalized than we are.

The markets for selling high-quality sapphire products are very competitive and have been characterized by rapid technological change. This competition could result in increased pricing pressure, reduced profit margins, increased sales and marketing expenses, and failure to increase, or the loss of, market share or expected market share, any of which would likely seriously harm our business, operating results and financial condition.

Some of our competitors and potential competitors are substantially larger and have greater financial, technical, marketing and other resources than we do. Given their capital resources, the large companies with which we compete, or may compete in the future, are in a better position to substantially increase their manufacturing capacity and research and development efforts or to withstand any significant reduction in orders by customers in our markets. Such larger companies typically have broader product lines and market focus and thus are not as susceptible to downturns in a particular market. Some of our competitors also receive government subsidies, which could create a competitive advantage. We would be at a competitive disadvantage if our competitors bring their products to market earlier, if their products are more technologically capable than ours, or if any of our competitors' products or technologies becomes preferred in the industry. Moreover, we cannot assure you that existing or potential customers will not develop their own products, or acquire companies with products that are competitive with our products. Any of these competitive threats could have a material adverse effect on our business, operating results or financial condition.

The average selling prices of sapphire products have historically been volatile and in recent years sapphire product prices have been increasingly depressed.

Historically, our industry has experienced volatility in product demand and pricing. However, in the last three years, the sales prices for our sapphire products have trended downward due to an over-supply of products in the market. In some countries, government programs support sapphire producers who would otherwise be unprofitable; in such circumstances, sapphire may be sold at prices below cost for an extended period of time, depressing market prices, to the detriment of our gross margins. This has had a significant adverse impact on our profitability and our results of operations. Moreover, changes in average selling prices of our products as a result of competitive pricing pressures increased sales discounts and new product introductions by our competitors could have a significant impact on our profitability. Although we attempt to optimize our product mix, introduce new products, reduce manufacturing costs and pass along certain increases in costs to our customers in order to lessen the effect of decreases in selling prices, we may not be able to successfully do so in a timely manner or at all, and our results of operations and business may be harmed.

Our future operating results may fluctuate significantly, which makes our future results difficult to predict and could cause our operating results for particular periods to fall below expectations.

Our revenues and operating results have fluctuated in the past and are likely to fluctuate in the future. These fluctuations are due to a number of factors, many of which are beyond our control. In connection with the Board of Directors' continuing review of alternatives with a goal of providing greater value to our stockholders, on September 12, 2016, we announced the Board's decision to limit our business focus to the optical and industrial sapphire markets and to exit the LED and mobile device markets. The optical and industrial sapphire markets are smaller markets than our historical undertakings and there is no assurance that we will be able to successfully expand our optical and industrial sapphire business, or that such shift in focus will ultimately improve our profitability or operating results.

Some of the factors that will affect operating results include, among others:

our ability to attract new customers;

gain or loss of significant customers;

timing and size of orders from and shipments to customers;

volatility of sapphire product prices;

our ability to develop, introduce and market new products and technologies on a timely basis;

our ability to meet customer specifications for products;

our ability to retain key relationships with suppliers and contractor third parties, including for the slicing and polishing functions for our sapphire crystal;

performance of suppliers, contractors and other third parties on whom we depend;

our ability to reduce costs commensurate to our scaled down operations;

competitive market conditions, including pricing actions by our competitors and our customers' competitors;

additions or departures of key personnel;

interruption of operations at our manufacturing facilities or the facilities of our suppliers; and

natural disasters, such as floods, hurricanes and earthquakes, as well as interruptions in power supply resulting from such events or due to other causes.

The foregoing factors are difficult to forecast, and these, as well as other factors, could materially adversely affect our quarterly or annual operating results. Likewise, if we acquire any new business, whether or not in the sapphire market, the operating results of that business will be subject to the same risks as are listed above. If our revenues or operating results fall below the expectations of investors or any securities analysts that may publish research on our Company, the price of our common stock would likely decline.

We depend on a few customers for a major portion of our sales and our results of operations would be adversely impacted if they reduce their order volumes.

Historically, we have earned, and believe that in the future we will continue to earn, a substantial portion of our revenue from a small number of customers. In 2017 our top two customers accounted for in the aggregate approximately 31% of our revenue and in 2016 our top customer accounted for approximately 60% of our revenue. If we were to lose one of our major customers or have a major customer significantly reduce its volume of business with us, our revenues and profitability would be materially reduced unless we are able to replace such demand with other orders promptly. We expect to continue to be dependent on our major customers, the number and identity of which may change from period to period.

We generally sell our products on the basis of purchase orders. Thus, most of our customers could cease purchasing our products with little or no notice and without penalties. In addition, delays in product orders could cause our quarterly revenue to vary significantly. A number of factors could cause our customers to cancel or defer orders, including interruptions to their operations due to a downturn in their industries, natural disasters, delays in manufacturing their own product offerings into which our products are incorporated, securing other sources for the products that we manufacture or developing such products internally.

Our products must meet exacting specifications and undetected defects may cause customers to return or stop buying our products.

Our customers establish demanding specifications for quality, performance and reliability that our products must meet. While we inspect our products before shipment, they still may contain undetected defects. If defects occur in our products, we could experience lost revenue, increased costs, delays in, or cancellations or rescheduling of orders or shipments, product returns or discounts, or damage to our reputation, any of which would harm our operating results and our business.

If the market acceptance of newly developed products does not meet our expectations or our efforts to enhance existing products are not successful, our future operating results may be harmed.

The development of new products may require substantial investment in development efforts. If our newly developed products do not achieve market acceptance, we may be unable to generate anticipated revenue and our operating results could be harmed.

Our continuing efforts to enhance our current products and to develop new products involve several risks, including:

our ability to anticipate and respond in a timely manner to changes in customer requirements;

the significant research and development investment that we may be required to make before market acceptance of a particular new or enhanced product;

the possibility that the industry may not accept our new or enhanced products after we have invested a significant amount of resources in development; and

competition from new technologies, processes and products introduced by our current and/or future competitors.

If we are unable to attract or retain qualified personnel, our business and product development efforts could be harmed.

Our success depends on our continued ability to identify, attract, hire, train, retain and motivate highly skilled technical, managerial, manufacturing, administrative and sales and marketing personnel. Competition for these individuals is intense, and we may not be able to successfully recruit, assimilate or retain sufficiently qualified personnel. In particular, we may encounter difficulties in recruiting and retaining a sufficient number of qualified technical personnel. The inability to attract and retain necessary technical, managerial, manufacturing, administrative and sales and marketing personnel could harm our ability to obtain new customers and develop new products and could adversely affect our business and operating results. In addition, the loss of the services, or distraction, of our senior management for any reason could adversely affect our business, operating results and financial condition.

We are dependent on the continued services and performances of certain senior management employees such as sales management and the head of operations.

Our future success is dependent on the continued services and continuing contributions of our senior management who must work together effectively in order to design and produce our products, expand our business, increase our revenue and improve our operating results. The loss of services of our senior management for any reason could adversely affect our business, operating results and financial condition.

We are subject to risks from international sales that may harm our operating results.

In 2017 and 2016, revenue from international sales for our optical and industrial markets products was approximately 37% and 35%, respectively, of our total optical and industrial markets revenue. We expect that revenue from international sales will continue to be a portion of our total revenue for the foreseeable future. Our international sales are subject to a variety of additional risks, including risks arising from:

sales variability as a result of transacting our foreign sales in U.S. dollars as prices for our products become less competitive in countries with currencies that are low or are declining in value against the U.S. dollar and more competitive in countries with currencies that are high or increasing in value against the U.S. dollar;

trading restrictions, tariffs, trade barriers and taxes;

differing intellectual property laws;

economic and political risks, wars, acts of terrorism, political unrest, pandemics, boycotts, curtailments of trade and other business restrictions;

the difficulty of enforcing contracts and collecting receivables through some foreign legal systems;

unexpected changes in regulatory requirements and other governmental approvals, permits and licenses; and

periodic foreign economic downturns.

Our future success will depend on our ability to anticipate and effectively manage these and other risks associated with our international sales. Our failure to manage any of these risks could harm our operating results.

Our gross margins and profitability may be adversely affected by energy costs.

Most of our power consumption takes place in our crystal growth facility in the U.S. Electricity prices could increase due to overall changes to the price of energy due to conditions in the Middle East, natural gas shortages in the U.S. and other economic conditions and uncertainties regarding the outcome and implications of such events. Once our current purchase agreements expire, if electricity prices increase significantly, we may not be able to pass these price increases through to our customers on a timely basis, if at all, which could adversely affect our gross margins and results of operations.

The protection of our intellectual property rights and the defense of claims of infringement against us by third parties may subject us to costly litigation.

Other companies might allege that we are infringing certain of their patents or other rights. If we are unable to resolve these matters satisfactorily, or to obtain licenses on acceptable terms, we may face litigation. Any litigation to enforce patents issued to us, to protect trade secrets or know-how possessed by us or to defend us or indemnify others against claimed infringement of the rights of others could have a material adverse effect on our financial condition and operating results. Regardless of the validity or successful outcome of any such intellectual property claims, we may need to expend significant time and expense to protect our intellectual property rights or to defend against claims of infringement by third parties, which could have a material adverse effect on us. If we lose any such litigation where we are alleged to infringe the rights of others, we may be required to:

pay substantial damages;

seek licenses from others; or

change, or stop manufacturing or selling, some or all of our products.

Any of these outcomes could have an adverse effect on our business, results of operations or financial condition.

We are subject to numerous environmental laws and regulations, which could expose us to environmental liabilities, increase our manufacturing and related compliance costs or otherwise adversely affect our business and operating results.

In our manufacturing process, we use water, oils, slurries, acids, adhesives and other industrial chemicals. We are subject to a variety of foreign, federal, state and local laws and regulations governing the protection of the environment. These environmental laws and regulations include those relating to the use, storage, handling, discharge, emission, disposal and reporting of toxic, volatile or otherwise hazardous materials used in our manufacturing processes. These materials may have been or could be released into the environment at properties currently or previously operated by us, at other locations during the transport of the materials, or at properties to which we send substances for treatment or disposal. If we were to violate or become liable under environmental laws and regulations or become non-compliant with permits required at some of our facilities, we could be held financially responsible and incur substantial costs, including investigation and cleanup costs, fines and civil or criminal sanctions, third-party property damages or personal injury claims. In addition, new laws and regulations or stricter enforcement of existing laws and regulations could give rise to additional compliance costs and liabilities.

Our operations are concentrated in two facilities, and the unavailability of one or both of these facilities could harm our business.

Our manufacturing, research and development, sales and marketing, and administrative activities are concentrated in two facilities in the Chicago metropolitan area. Should a casualty, natural disaster, inclement weather, an act of terrorism, an outbreak of disease, power loss, an act of terrorism or similar event affect the Chicago area, our operations could be significantly impacted. We may not be able to replicate the manufacturing capacity and other operations of our Chicago facilities or such replication could take significant time and resources to accomplish. The disruption from such an event could adversely affect or interrupt entirely our ability to conduct our business.

Our U.S. net operating loss carryforwards may expire or could be substantially limited if we experience an ownership change as defined in the Internal Revenue Code (“IRC”) or if changes are made to the IRC.

We have significant U.S. net operating loss carryforwards (the “Tax Attributes”). Under federal tax laws, we can carry forward and use our Tax Attributes to reduce our future U.S. taxable income and tax liabilities until such Tax Attributes expire in accordance with the Internal Revenue Code of 1986, as amended (the “IRC”). Our NOLs and carry-forwards provide a benefit to us, if fully utilized, of significant future tax savings. However, our ability to use these tax benefits in future years will depend upon the amount of our federal and state taxable income. If we do not have sufficient federal and state income in future years to use the benefits before they expire, we will permanently lose the benefit of the NOLs. Our ability to use the tax benefits associated with our NOLs is dependent upon our generation of future taxable profits and our ability to successfully identify and acquire suitable acquisition or investment candidates.

Additionally, Section 382 and Section 383 of the IRC provide an annual limitation on our ability to utilize our Tax Attributes, as well as certain built-in-losses, against future U.S. taxable income in the event of a change in ownership, as defined under the IRC. While we have implemented a stockholder’s right plan to protect the net operating loss carryforwards, there is no assurance that we will not experience a change in ownership in the future as a result of changes in our stock ownership, and any such subsequent changes in ownership for purposes of the IRC could further limit our ability to use our Tax Attributes.

Under the recently enacted Tax Cut and Jobs Act, U.S. NOLs generated on or after January 1, 2018 could be limited to 80 percent of taxable income. If other changes were made to the IRC, they could impact our ability to utilize our net operating losses. Accordingly, any such occurrences could adversely affect our financial condition, operating results and cash flows.

RISKS RELATED TO OWNERSHIP OF OUR COMMON STOCK

The trading price of our common stock has been and will likely continue to be volatile due to various factors, some of which are beyond our control, and each of which could adversely affect our stockholders' value.

Factors related to our Company and our business, as well as broad market and industry factors, may adversely affect the market price of our common stock, regardless of our actual operating performance. Such factors that could cause fluctuations in our stock price include, among other things:

changes in market valuations of other companies in our industry;

changes in financial guidance or estimates by us, by investors or by any financial analysts who might cover our stock or our industry;

our ability to meet the performance expectations of financial analysts or investors;

our ability to develop and market new and enhanced products on a timely basis;

credit conditions;

announcements by us or our competitors of significant products, contracts, acquisitions or strategic partnerships;

general market and economic conditions; and

the size of the public float of our stock.

Our certificate of incorporation, bylaws and Delaware law may discourage takeovers and business combinations that our stockholders might consider in their best interests.

A number of provisions in our certificate of incorporation and bylaws, as well as anti-takeover provisions of Delaware law, may have the effect of delaying, deterring, preventing or rendering more difficult a change in control of Rubicon that our stockholders might consider in their best interests. These provisions include:

a classified Board of Directors;

a tax benefits preservation plan designed to preserve our ability to utilize our net operating losses as a result of certain stock ownership changes, which may have the effect of discouraging transactions involving an actual or potential change in our ownership;

granting to the Board of Directors sole power to set the number of directors and to fill any vacancy on the Board of Directors, whether such vacancy occurs as a result of an increase in the number of directors or otherwise;

limitations on the ability of stockholders to remove directors;

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the ability of our Board of Directors to designate and issue one or more series of preferred stock without stockholder approval, the terms of which may be determined at the sole discretion of the Board of Directors;

prohibition on stockholders from calling special meetings of stockholders;

prohibition on stockholders from acting by written consent; and

establishment of advance notice requirements for stockholder proposals and nominations for election to the Board of Directors at stockholder meetings.

These provisions may prevent our stockholders from receiving the benefit from any premium to the market price of our common stock offered by a bidder in a takeover context. Even in the absence of a takeover attempt, the existence of these provisions may adversely affect the prevailing market price of our common stock if they are viewed as discouraging takeover attempts in the future.

The foregoing provisions of our certificate of incorporation and bylaws may also make it difficult for stockholders to replace or remove our management. These provisions may facilitate management entrenchment that may delay, deter, render more difficult or prevent a change in our control, which may not be in the best interests of our stockholders.

We are subject to litigation risks, including securities class action litigation, which may be costly to defend.

All industries, including ours, are subject to legal claims, including securities litigation. When the market price of a stock declines significantly, due to factors such as trends in the stock market in general, broad market and industry fluctuations or operating performance, holders of that stock have sometimes instituted securities class action litigation against the company that issued the stock. This sort of litigation can be particularly costly and may divert the attention of our management and our resources in general. We have been subject to securities class action litigation in the past, as disclosed in our previous filings with the SEC. Due to the inherent uncertainty of the litigation process, the resolution of any particular legal claim or proceeding (including by settlement) could have a material effect on our business, financial condition, results of operations or cash flows. Further, uncertainties resulting from the initiation and continuation of securities or other litigation could harm our ability to obtain credit and financing for our operations and to compete in the marketplace.

Our Board of Directors does not intend to declare or pay any dividends to our stockholders in the foreseeable future.

The declaration, payment and amount of any future dividends will be made at the discretion of our Board of Directors and will depend upon, among other things, the results of our operations, cash flows and financial condition, operating and capital requirements, and other factors the Board of Directors considers relevant. There is no plan to pay dividends in the foreseeable future, and if dividends are paid, there can be no assurance with respect to the amount of any such dividend.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Disclosure under this item is not required, as the registrant is a smaller reporting company.

ITEM 2. PROPERTIES

Our executive, research and development and manufacturing functions are located on properties that we lease or own. We lease properties in Franklin Park, Illinois and Bensenville, Illinois. These facilities total approximately 62,000 square feet in two buildings, which includes 30,000 square feet in our Bensenville, Illinois facility and 32,000 square feet in our Franklin Park, Illinois facility. The Franklin Park, Illinois facility is primarily used for manufacturing. The Bensenville, Illinois facility houses crystal growth, research and development and our corporate executive offices. The leases for the Franklin Park, Illinois and Bensenville, Illinois facilities terminate in July 2018 and June 2019, respectively.

Future minimum payments under these leases, in the aggregate are as follows:

| Year ending December 31, | Lease Payments (in thousands) |
|--------------------------|--|
| 2018 | \$ 468 |
| 2019 | 145 |

In addition, we own a 134,400 square foot facility in Batavia, Illinois previously used for crystal growth, manufacturing, research and development and office space. We also own a parcel of extra land in Batavia, Illinois which was acquired in 2012 for future expansion. In addition, we own a 65,000 square foot facility in Penang, Malaysia previously used for manufacturing operations. All of the real property we own are currently available for sale or lease and are actively being marketed.

ITEM 3.LEGAL PROCEEDINGS

From time to time, we, our subsidiaries and/or our directors and officers may be named in claims arising in the ordinary course of business. Management believes that there are no pending legal proceedings involving us or any of our subsidiaries that will, individually or in the aggregate, have a material adverse effect on our consolidated results of operations or financial condition.

ITEM 4.MINE SAFETY DISCLOSURES

Not applicable.

PART II**ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES****Market Information**

Our common stock began trading on the NASDAQ Global Market under the symbol "RBCN" on November 16, 2007. On October 20, 2016, we transferred the listing of our common stock from the NASDAQ Global Market to the NASDAQ Capital Market. The following table sets forth the high and low sales prices for our common stock as reported on the NASDAQ for the periods indicated:

| | High | Low |
|-------------------------------------|---------|--------|
| Fiscal year ended December 31, 2017 | | |
| First Quarter | \$9.60 | \$4.90 |
| Second Quarter | \$10.45 | \$6.40 |
| Third Quarter | \$9.41 | \$6.71 |
| Fourth Quarter | \$9.05 | \$7.51 |

| | High | Low |
|-------------------------------------|---------|--------|
| Fiscal year ended December 31, 2016 | | |
| First Quarter | \$17.80 | \$7.20 |
| Second Quarter | \$8.10 | \$5.10 |
| Third Quarter | \$7.90 | \$5.60 |
| Fourth Quarter | \$6.70 | \$4.60 |

Holders

As of March 5, 2018, our common stock was held by approximately 19 stockholders of record and there were 2,737,813 shares of our common stock outstanding.

Dividend Policy

We have never declared or paid cash dividends on our common stock. We currently intend to retain future earnings to finance the growth and development of our business, and we do not anticipate declaring or paying any cash dividends in the foreseeable future. The declaration, payment and amount of any future dividends will be made at the discretion of our Board of Directors.

ITEM 6. SELECTED FINANCIAL DATA

Disclosure under this item is not required as the registrant is a smaller reporting company.

Recent Sales of Unregistered Securities

None.

Issuer Purchases of Equity Securities

None.

ITEM 7. 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 together with our financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. This discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. You should review the "Risk Factors" section of this Annual Report for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements described in the following discussion and analysis.

OVERVIEW

We are a vertically integrated, advanced materials provider specializing in monocrystalline sapphire for applications in optical and industrial systems. We use our proprietary crystal growth technology to produce high-quality sapphire products to meet our customers exacting specifications. Historically, we have provided sapphire products to the LED and mobile device markets, which are the largest markets for sapphire. However, given competitive pressures in those markets, in September 2016 we announced our decision to limit our focus in the near-term on the optical and industrial sapphire markets and exit the LED market. We believe that we continue to have a reputation as one of the highest quality sapphire producers in the market. We provide optical and industrial sapphire products in various shapes and sizes, including round and rectangular windows and blanks, domes, tubes and rods.

With the decision to exit the LED market, in November 2016 we stopped production activities in Penang, Malaysia and subsequently closed this facility. Our wafer patterning equipment in Malaysia was sold in the fourth quarter of 2016 for \$4.5 million. We held an auction in March 2017 in an effort to sell certain polishing and fabrication equipment with mixed results. Since the March 2017 auction, we sold some additional equipment and continue to seek buyers for the remaining unsold equipment. Additionally, we are seeking to sell our Malaysia real estate. The timing of the sale of the equipment and real estate located in Malaysia is difficult to predict.

Following the decision in the fourth quarter 2016 to focus on smaller optical and industrial sapphire markets, we determined that we had more crystal growth and fabrication capacity in the U.S. than we needed for our current business strategy. Consequently, we have consolidated operations into our leased spaces in Bensenville, Illinois and Franklin Park, Illinois and vacated our owned facility in Batavia, Illinois. In March 2017, we held an auction to sell excess equipment from our Batavia facility. Other than crystal growth furnaces, most of the equipment was sold. The plant itself is a special purpose facility with extensive enhancements to power and water-cooling systems required for crystal growth production.

We are also actively trying to sell or lease this property and our initial focus is to find a buyer that is interested in both the building and improved infrastructure. However, to date we have been unable to find a buyer that values such enhancements and ultimately may be unable to sell this real estate for more than the value of a standard facility. In fact we may be required by a buyer to pay for the removal of the enhancements. The timing on the sale or lease of this real estate and sale of our crystal growth furnaces is difficult to predict.

With the focus on smaller optical and industrial markets, the closing of our plant in Malaysia, and the consolidation of our operations in the U.S., our LED revenue has ceased. Approximately 91% of our sales in 2017 came from optical and industrial sapphire components. The following table summarizes optical revenue for each of the last three years:

| Year ended December 31, | Optical revenue (in thousands) | % of total revenue | |
|-------------------------|--------------------------------------|--------------------------|---|
| 2017 | \$ 4,615 | 91 | % |
| 2016 | \$ 4,568 | 23 | % |
| 2015 | \$ 5,086 | 21 | % |

We operate in a very competitive market. Our ability to expand our optical and industrial business and acceptance of new product offerings is difficult to predict.

In addition, our current optical and industrial sapphire business serves smaller markets than our historical undertakings, so we are actively evaluating the acquisition of profitable companies outside of the sapphire market to utilize our substantial net operating loss carry-forwards. Because acquisitions are being given greater consideration, in February 2017, we commenced a search for a new CEO with more extensive experience in mergers and acquisitions. On March 16, 2017, we announced the appointment of Timothy E. Brog as our new President and CEO, effective as of March 17, 2017. Mr. Brog has served on our Board of Directors since May 2016 and will continue to serve as our director.

Historically, a significant portion of our revenue has been derived from sales to relatively few customers. For the year ended December 31, 2017, we had two customers individually that accounted for approximately 18% and 13% of revenue. For the year ended December 31, 2016, we had one customer individually that accounted for approximately 60% of our revenue. No other customer individually accounted for 10% or more of our revenues during the years ended December 31, 2017 and 2016. We expect our sales to continue to be concentrated among a small number of customers. However, we also expect that our significant customers may change from time to time.

We sell our products on a global basis and have historically derived a significant portion of our revenue from LED customers outside of the U.S. In such periods, the majority of our sales were to the European and Asian markets. Since we have stopped selling LED products in 2016, we expect a major source of our future revenue to be from the North American market. For the year ended December 31, 2017, the North American and European markets accounted for 80% and 17% of our revenue, respectively. For the year ended December 31, 2016, the European, Asian, North American and Australian markets accounted for 48%, 28%, 21% and 3% of our revenue, respectively. All of our revenue and corresponding accounts receivable are denominated in U.S. dollars. For more information about our revenues by country, see Note 2 – Segment Information of our Consolidated Financial Statements included in this Annual Report on Form 10-K. For a discussion of risks associated with our international sales see the risk factor captioned “*We are subject to risks from international sales that may harm our operating results*” under Item 1A “Risk Factors”.

Financial operations

Revenue. Our revenue has historically consisted of sales of sapphire materials sold in core, polished and patterned substrate forms in two, three, four, six and eight-inch diameters as well as optical materials sold as blanks or polished windows. Products are made to varying specifications, such as crystal planar orientations and thicknesses. With the focus on smaller optical and industrial markets, the closing of our plant in Malaysia, and the consolidation of our operations in the U.S., we expect in future periods our revenue will primarily be from optical materials. We recognize research and development revenue in the period during which the related costs are incurred. Our R&D revenue in recent years has been related to LANCE, our large rectangular window development which is largely complete. As a result, of our finishing the growth requirements for the AFRL in 2016, our R&D revenue as a percentage of total revenue was lower in 2017. We recognize revenue based upon shipping terms with our customers and from our government contract as costs and fees are incurred. Delays in product orders or changes to the timing of shipments could cause our quarterly revenue to vary significantly. All of our revenue and corresponding accounts receivable are denominated in U.S. dollars. We manage direct sales primarily from our Bensenville, Illinois offices. Substantially all of our revenue is generated by our direct sales force and we expect this to continue in the future.

Cost of goods sold. Our cost of goods sold consists primarily of manufacturing materials, labor, manufacturing-related overhead such as utilities, depreciation and rent, provisions for excess and obsolete inventory reserves, idle plant charges, outsourcing costs, freight and warranties. We purchase materials and supplies to support current and future demand for our products. We are subject to variations in the cost of consumables from period to period because we do

not have long-term fixed-price agreements with our suppliers. We currently outsource some of our production processes and needs.

Gross profit. Our gross profit has been and will continue to be affected by a variety of factors, including average sales prices of our products, product mix, our ability to reduce manufacturing costs, idle plant charges and fluctuations in the cost of electricity, raw materials and other supplies.

General and administrative expenses. General and administrative expenses (“G&A”) consist primarily of compensation and associated costs for employees in finance, human resources, information technology and administrative activities, charges for accounting, legal, insurance, and stock-based compensation.

Sales and marketing expenses. Sales and marketing expenses consist primarily of salaries, commissions and associated costs for employees engaged in sales activities, product samples, charges for participation in trade shows and travel.

Research and development expenses. Research and development (“R&D”) expenses include costs related to engineering personnel, materials and other product development related costs. R&D is expensed as incurred.

Other income (expense). Other income (expense) consists of interest income and expense and gains and losses on investments and currency translation.

Provision for income tax. We account for income taxes under the asset and liability method whereby the expected future tax consequences of temporary differences between the book value and the tax basis of assets and liabilities are recognized as deferred tax assets and liabilities, using enacted tax rates in effect for the year in which the differences are expected to be recognized. Our analysis of ownership changes that limit the utilization of our net operating loss (“NOL”) carryforwards as of December 31, 2017, shows no impact on such utilization. We are in a cumulative loss position for the past three years which is considered significant negative evidence that is difficult to overcome on a “more likely than not” standard through objectively verifiable data. Based on an evaluation in accordance with the accounting standards, as of December 31, 2017 and 2016, a valuation allowance has been recorded against the net U.S. and Malaysia deferred tax assets in order to measure only the portion of the deferred tax assets that are more likely than not to be realized based on the weight of all the available evidence. Until an appropriate level of profitability is attained, we expect to maintain a full valuation allowance on our U.S. and Malaysia net deferred tax assets. Any U.S. and Malaysia tax benefits or tax expense recorded on the Consolidated Statement of Operations will be offset with a corresponding valuation allowance until such time that we change our determination related to the realization of deferred tax assets. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

Stock-based compensation. The majority of our stock-based compensation relates primarily to our Board of Directors and administrative personnel and is accounted for as a G&A expense. For the years ended December 31, 2017 and 2016, our stock-based compensation expense was \$897,000 and \$1.4 million, respectively.

We continue to review a variety of alternatives with a goal of providing greater value to our stockholders. These alternatives could result in, among other things, further modifying or eliminating certain of our operations, selling material assets, seeking additional financing, a sale of the business, a merger, consolidation or other business combination, partnering or other collaboration agreements, potential acquisitions or recapitalizations, or we may continue to operate with our current business plan and strategy. We cannot provide assurance that this process will result in the consummation of any transaction, or that the consummation of any transaction will provide greater value to our stockholders.

RESULTS OF OPERATIONS

The following table sets forth our statements of operations for the periods indicated:

| | Year ended December 31, | |
|------------------------------------|----------------------------|-------------|
| | 2017 | 2016 |
| | (in millions) | |
| Revenue | \$5.0 | \$19.6 |
| Cost of goods sold | 10.5 | 45.6 |
| Gross loss | (5.5) | (26.0) |
| Operating expenses: | | |
| General and administrative | 4.5 | 7.7 |
| Sales and marketing | 0.8 | 1.4 |
| Research and development | 1.0 | 2.5 |
| Long-lived asset impairment charge | 5.0 | 26.6 |
| Loss (gain) on disposal of assets | 1.1 | (1.5) |
| Total operating expenses | 12.4 | 36.7 |
| Loss from operations | (17.9) | (62.7) |
| Other income (expense) | 0.2 | (0.4) |
| Loss before income taxes | (17.7) | (63.1) |
| Income tax (expense) benefit | (0.1) | 0.2 |
| Net loss | \$(17.8) | \$(62.9) |

The following table sets forth our statements of operations as a percentage of total revenue for the periods indicated:

| | Year ended December 31, | |
|------------------------------------|----------------------------|-------------|
| | 2017 | 2016 |
| Revenue | 100 % | 100 % |
| Cost of goods sold | 210 | 232 |
| Gross loss | (110) | (132) |
| Operating expenses: | | |
| General and administrative | 90 | 39 |
| Sales and marketing | 16 | 8 |
| Research and development | 20 | 13 |
| Long-lived asset impairment charge | 100 | 135 |
| Loss (gain) on disposal of assets | 22 | (8) |

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| | | |
|------------------------------|--------|--------|
| Total operating expenses | 248 | 187 |
| Loss from operations | (358) | (319) |
| Other income (expense) | 4 | (2) |
| Loss before income taxes | (354) | (321) |
| Income tax (expense) benefit | (2) | 1 |
| Net loss | (356%) | (320%) |

Comparison of years ended December 31, 2017 and 2016

Revenue. Revenue was \$5.0 million for the year ended December 31, 2017 and \$19.6 million for the year ended December 31, 2016, a decrease of \$14.6 million. As we have ceased all LED manufacturing activities and exited the LED market in 2016, for the year ended December 31, 2017, revenue from the sales of our LED products was zero, a decrease of \$14.8 million.

Gross loss. Gross loss was \$5.5 million and \$26.0 million for the years ended December 31, 2017 and 2016, respectively, a decrease in loss of \$20.5 million. Of this \$20.5 million decrease in gross loss, \$13.1 million was attributable to our exit from the LED market and the elimination of operations related to manufacturing of LED products, as well as a decrease in production costs due to improved production efficiency. In addition, \$3.8 million of the decrease in gross loss was due to a smaller write-down related to having an excess of two-inch core and raw material inventory, \$2.9 million of the decrease was due to a smaller write-down of excess consumables inventory and \$1.0 million was attributable to severance expenses for the reduction in staffing in the U.S. and Malaysia which occurred in the year ended December 31, 2016. As we have completed our relocation and consolidation of operations in the U.S., we have experienced a decrease in the restructuring expense of \$187,000. This was partially offset by an excess sapphire crystal inventory write-down expense of \$451,000 recorded for the year ended December 31, 2017.

General and administrative expenses. G&A expenses were \$4.5 million and \$7.7 million for the years ended December 31, 2017 and 2016, respectively, a decrease of \$3.2 million. The decrease was primarily attributable to a decrease in legal and investor meeting expenses of \$1.5 million, of which \$1.3 million of the decrease related to our proxy solicitation and annual meeting process for a contested director election which occurred in the year ended December 31, 2016. We also experienced a decrease in employee compensation costs of \$955,000 on lower headcount, partially offset by an increase in executive severance expense of \$458,000 and executive restricted stock unit grant expense of \$320,000. In addition, we experienced a decrease in the board of directors' compensation costs of \$440,000, a decrease in the administrative office maintenance and connectivity costs of \$565,000 due to closing of the Malaysia facility and renegotiated contracts, a decrease of \$305,000 in franchise tax on withdrawal from a state, a decrease in insurance costs of \$281,000 on renegotiated contracts, a decrease in financing and banking fees of \$98,000, as we have paid off the short-term loan and a decrease in recruiting and immigration assistance costs of \$70,000. As a small offset of these reductions in G&A expenses was a higher bad debt expense in 2017 as compared to 2016 because we collected on an old outstanding balance in 2016 which decreased the bad debt expense in 2016. This resulted in the bad debt expenses acting as a credit in G&A in 2016 in the amount of \$215,000.

Sales and marketing expenses. Sales and marketing expenses were \$800,000 and \$1.4 million for the years ended December 31, 2017 and 2016, respectively, a decrease of \$600,000. The decrease in sales and marketing expenses was primarily attributable to a decrease in employee compensation costs of \$450,000 on lower headcount and a decrease in travel and other costs related to sales and marketing of \$160,000.

Research and development expenses. R&D expenses were \$962,000 and \$2.5 million for the years ended December 31, 2017 and 2016, respectively, a decrease of \$1.5 million. The decrease in research and development expenses was attributable to a decrease in employee compensation costs of \$800,000 on a lower headcount, a decrease in project expenses and equipment costs of \$650,000 and a decrease in employee travel costs of \$90,000.

Long-lived asset impairment charges. When circumstances, such as adverse market conditions, indicate that the carrying value of a long-lived asset may be impaired, we perform an analysis to review the recoverability of the asset's carrying value. We make estimates of the undiscounted cash flows (excluding interest charges) from the expected future operations of the asset. These estimates consider factors such as expected future operating income, operating trends and prospects, as well as the effects of demand, competition and other factors. If the analysis indicates that the carrying value is not recoverable from future cash flows, an impairment loss is recognized to the extent that the carrying value exceeds the estimated fair value. The estimated fair value of assets is determined using appraisal techniques which assume the highest and best use of the asset by market participants, considering the use of the asset that is physically possible, legally permissible, and financially feasible at the measurement date. Any impairment losses are recorded as operating expenses, which reduce net income.

In September 2016, as we believed the prospects of becoming profitable in the LED substrate market to be unlikely for the foreseeable future, we announced our decision to limit our focus to the optical and industrial sapphire markets and to exit the LED market. This resulted in closing of our Malaysia facility. In the fourth quarter of 2016, we developed a plan to scale down the remaining operations and sell additional assets that would not be needed for our business plan. In this regard, we identified excess U.S. machinery, equipment and facilities. We engaged an independent valuation company to assist in the determination of the fair value of assets to provide an updated valuation of the U.S. and Malaysia machinery and equipment. We evaluated our U.S. asset portfolio for the assets continuing to be used in operations using a cost and market approach to determine the current fair value. We evaluated our Malaysia asset portfolio and excess U.S. assets based on assuming an orderly liquidation plan which considers economic obsolescence and sales of comparable equipment, as it is our intention to sell these assets. Based on this review, we recorded for the year ended December 31, 2016 an asset impairment charge on U.S. and Malaysia machinery and equipment of \$12.3 million.

We are actively pursuing the sale or lease of our 134,400 square foot manufacturing and office facility in Batavia, Illinois, a parcel of extra land we own in Batavia, Illinois, and a 65,000 square foot facility in Penang, Malaysia. Since the expected sale price is below the book value of these properties, for the year ended December 31, 2016, an impairment charge of \$14.3 million was recorded. For the year ended December 31, 2017, the expected sale price for the Batavia, Illinois facility and parcel of extra land was further reduced resulting in recording an additional impairment charge of \$4.0 million.

At September 30, 2017, we reviewed the current fair value of our assets. With the scaling down of our U.S. operations, we identified at September 30, 2017, additional assets that will not be needed. We reduced the net book value of certain machinery and equipment and recorded an asset impairment charge of \$675,000. At December 31, 2017, we reviewed the current fair value of the U.S. and Malaysia machinery and equipment. An impairment charge of \$354,000 was recorded on lower expected sales prices for assets held for sale and identification of additional assets that will not be needed to support current operations.

We will continue to assess our long-lived assets to ensure the carrying amount of these assets is still appropriate given any changes in the asset usage, marketplace and other factors used in determining the current fair value.

We cannot guarantee that we will be able to successfully complete the sale or lease of any assets.

Other income (expense). Other income was \$161,000 and other expense was \$385,000 for the years ended December 31, 2017 and 2016, respectively, a decrease in other expense of \$546,000. The decrease is primarily attributable to the recognition in the year ended December 31, 2017 of the realized gain on foreign currency translation of \$405,000. We also recorded an increase in interest income of \$43,000. In addition, as we have paid off a short-term loan in 2016, interest expense was zero for the year ended December 31, 2017, a decrease of \$98,000.

Income tax (expense) benefit. We are subject to income taxes in the U.S. and Malaysia. On a quarterly basis, we assess the recoverability of deferred tax assets and the need for a valuation allowance. Such evaluations involve the application of significant judgment and multiple factors, both positive and negative, are considered. For the year ended December 31, 2017, a valuation allowance has been included in the 2017 forecasted effective tax rate. We are in a cumulative loss position for the past three years, which is considered significant negative evidence that is difficult to overcome on a “more likely than not” standard through objectively verifiable data. Under the accounting standards, objective verifiable evidence is given greater weight than subjective evidence such as our projections for future growth. Based on an evaluation in accordance with the accounting standards, a valuation allowance was recorded against the net U.S. deferred tax assets in order to measure only the portion of the deferred tax assets that are more likely than not to be realized based on the weight of all the available evidence. At December 31, 2017, we continue to be in a three-year cumulative loss position; therefore, as of December 31, 2017, we maintained a full valuation allowance on our U.S. and Malaysia net deferred tax assets and until an appropriate level of profitability is attained,

we expect to maintain a full valuation allowance going forward. Any U.S. and Malaysia tax benefits or tax expense recorded on our Consolidated Statement of Operations will be offset with a corresponding valuation allowance until such time that we change our determination related to the realization of deferred tax assets. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

On December 22, 2017, the U.S. enacted the Tax Cuts and Jobs Act (the "Act") which among other provisions reduced the U.S. corporate tax rate from 35% to 21% effective January 1, 2018. The SEC issued guidance on accounting for the tax effects of the Act. The guidance allows us to record provisional amounts for those impacts, with the requirement that the accounting be completed in a period not to exceed one year from the date of enactment. We have not completed our accounting for the tax effects of enactment of the Act; however we have made reasonable estimates of the effects on our existing deferred tax balances and the transition tax or deemed repatriation tax. As a result, the provision for income taxes and effective tax rate in 2017 included a non-cash charge of \$28.0 million due primarily to the remeasurement of deferred tax assets and liabilities expected to apply when the temporary differences are realized/settled at a rate of 21% versus 35%. As we are in a full valuation allowance position (as described above), an equal benefit adjustment was recorded. Also, we estimated a deemed inclusion in the amount of \$3.9 million related to the transition tax on untaxed earnings overseas which was applied against our 2017 NOL. The tax provision for the years ended December 31, 2017 and 2016 is based on an estimated combined statutory effective tax rate. We recorded for the year ended December 31, 2017 a tax expense of \$88,000 and for the year ended December 31, 2016 a tax benefit of \$223,000, for an effective tax rate of (0.5%) and 0.4%, respectively. For the years ended December 31, 2017 and 2016, the difference between our effective tax rate and the U.S. federal 35% statutory rate and state 6.2% (net of federal benefit) statutory rate was primarily related to U.S. and Malaysia valuation allowances, Malaysia foreign tax rate differential and Malaysia withholding taxes.

At December 31, 2017, we had separate Federal and Illinois NOLs of \$177.9 million and \$212.0 million, respectively, which begin to expire in 2021 and 2019, respectively. With the adoption of ASU 2016-09 in 2017, we recorded a deferred tax asset related to \$26.4 million of unrecorded federal and state NOLs attributable to stock option exercises. The impact of bringing these NOLs onto the balance sheet was fully offset by the valuation allowance (as described above). We have recorded an uncertain tax position of \$2.6 million that further reduces the net operating loss deferred tax assets reported in the financial statements. In addition, at December 31, 2017, we had Federal and Illinois research and development credits and Illinois investment tax credit of \$805,000, \$66,000 and \$95,000, respectively which begin to expire in 2018.

LIQUIDITY AND CAPITAL RESOURCES

We have historically funded our operations using a combination of issuances of common stock and cash generated from our operations.

As of December 31, 2017, we had cash and short-term investments totaling \$18.0 million, including cash of \$6.9 million held in deposits at major banks, \$4.6 million invested in money market funds and \$6.5 million of short term investments including corporate notes and bonds and commercial paper.

We plan to limit our capital expenditures to only those required under existing obligations or as otherwise necessary to realize value from the development, commercialization or sale of products.

Cash flows from operating activities

The following table represents the major components of our cash flows from operating activities for the years ended December 31, 2017 and 2016:

| | Year ended December 31, 2017 2016 (in millions) | |
|---|--|----------|
| Net loss | \$(17.8) | \$(62.9) |
| Non-cash items: | | |
| Depreciation and amortization | 1.2 | 6.1 |
| Net loss (gain) on disposal of assets | 1.1 | (1.5) |
| Stock based compensation and other, net | 0.9 | 1.3 |
| Long-lived asset impairment charge | 5.1 | 26.6 |
| Deferred taxes | — | (0.6) |
| Total non-cash items: | 8.3 | 31.9 |
| Changes in working capital: | | |
| Accounts receivable | 1.9 | (0.8) |
| Inventories | 2.8 | 12.0 |
| Inventory reserves | 2.2 | 1.6 |
| Prepaid expenses and other assets | 1.5 | 5.6 |

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| | | |
|--|----------|----------|
| Accounts payable | (0.4) | (2.4) |
| Other accruals | (0.5) | (0.3) |
| Total working capital items: | 7.5 | 15.7 |
| Net cash used in by operating activities | \$(2.0) | \$(15.3) |

Cash used in operating activities was \$2.0 million for the year ended December 31, 2017. During such period, we generated a net loss of \$17.8 million, which included non-cash charges of \$8.3 million, and an increase in cash from net working capital of \$7.5 million. The net working capital cash increase was driven by a decrease in inventory of \$5.0 million primarily related to a decrease in raw materials of \$2.6 million due to sales and a write-down of excess raw materials and decrease in work-in-process and finished goods inventories of \$2.4 million due to a write-down of excess inventory and downsized operations. Additionally, we experienced a decrease in accounts receivable of \$1.9 million on decreased revenue and improved collections and a decrease in prepaid and other assets of \$1.6 million due to excess consumables disposals and write-downs and on amounts collected on asset sales. This decrease was partially offset by a decrease in accounts payable and other accruals of \$569,000 on timing of payments and due to downsized operations and a decrease in corporate income and franchise tax accrual of \$273,000 on a reduced state franchise tax.

Cash used in operating activities was \$15.3 million for the year ended December 31, 2016. During such period, we generated a net loss of \$62.9 million, which included non-cash charges of \$31.9 million, and an increase in cash from net working capital of \$15.7 million. The net working capital cash increase was driven by a decrease in inventory of \$13.6 million primarily related to write-downs of excess core and raw materials inventories and complete draw down of consignment inventory by our major customer, and a decrease in prepaid expenses and other assets of \$5.6 million primarily related to a decrease in prepaid furnace and machinery components. This increase was partially offset by an increase in accounts receivable of \$847,000 on timing of customer payments and a decrease in accounts payable and other accruals of \$2.7 million on timing of payments.

Cash flows from investing activities

The following table represents the major components of our cash flows from investing activities for the years ended December 31, 2017 and 2016:

| | Year ended December 31, 2017 2016 (in millions) | |
|---|--|----------|
| Purchases of property and equipment | \$— | \$(0.7) |
| Purchases of investments | (6.5) | — |
| Proceeds from disposal of assets | 2.5 | 5.3 |
| Proceeds from sale of investments | 0.1 | 8.9 |
| Net cash (used in) provided by investing activities | \$(3.9) | \$13.5 |

Net cash used in investing activities was \$3.9 million and net cash provided by investment activities was \$13.5 million for the years ended December 31, 2017 and 2016, respectively. In 2017, we used proceeds from disposal of assets in connection with our decision to exit the LED market of \$2.5 million and proceeds from the sale of investments of \$57,000 to fund our operations. This was partially offset by the \$6.5 million used to purchase investment securities.

In 2016, we used proceeds from the sale of investments of \$8.9 million and proceeds from disposal of assets in connection with our decision to exit the LED market of \$5.3 million to fund our operations. This was partially offset by the \$705,000 used to purchase equipment for our new coating process.

Cash flows from financing activities

Net cash used in financing activities was \$207,000 for the year ended December 31, 2017, which represents cash used to settle net equity awards of \$189,000, and a change in restricted cash of \$18,000. Net cash used in financing activities was \$1.5 million for the year ended December 31, 2016, which is primarily due to cash used to pay off borrowings under our credit facility.

Future liquidity requirements

We believe that our existing cash, cash equivalents, anticipated cash flows from operating activities and proceeds from sales or lease of fixed assets will be sufficient to meet our anticipated cash needs for at least the next twelve months. However, if our ability to generate sufficient operating cash flow or our use of cash in the next twelve months were to significantly adversely change, we may not have enough funds available to continue operating at our current level in future periods. Our cash needs include cash required to fund our operations. If the assumptions underlying our business plan regarding future revenues and expenses change, or if unexpected opportunities or needs arise, we may seek to raise additional cash by selling equity or convertible debt securities. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our stockholders could be significantly diluted, and these newly-issued securities may have rights, preferences or privileges senior to those of existing stockholders.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The preparation of financial statements in accordance with accounting principles generally accepted in the U.S. requires us to make estimates, assumptions and judgments that affect the amounts reported in our financial statements and the accompanying notes. We base our estimates on historical experience and various other assumptions that we believe to be reasonable. Although these estimates are based on our present best knowledge of the future impact on the Company of current events and actions, actual results may differ from these estimates, assumptions and judgments.

We consider to be critical those accounting policies that require our most subjective or complex judgments, which often result from a need to make estimates about the effect of matters that are inherently uncertain, and that are among the most important of our accounting policies in the portrayal of our financial condition and results of operations. We believe the following to be our critical accounting policies, including the more significant estimates and assumptions used in preparation of our financial statements.

Foreign currency translation and transactions.

Rubicon Technology Worldwide LLC and Rubicon Technology Hong Kong Limited assets and liabilities are translated into U.S. dollars at exchange rates existing at the respective balance sheet dates and capital accounts at historical exchange rates. The results of operations are translated into U.S. dollars at the average exchange rates during the respective period. Translation adjustments resulting from fluctuations in exchange rates for Rubicon Technology Worldwide LLC and Rubicon Technology Hong Kong Limited are recorded as a separate component of accumulated other comprehensive income (loss) within stockholders' equity.

We have determined that the functional currency of Rubicon Sapphire Technology (Malaysia) SDN BHD is the U.S. dollar. Rubicon Sapphire Technology (Malaysia) SDN BHD's assets and liabilities are translated into U.S. dollars using the remeasurement method. Non-monetary assets are translated at historical exchange rates and monetary assets are translated at exchange rates existing at the respective balance sheet dates. Translation adjustments for Rubicon Sapphire Technology (Malaysia) SDN BHD are included in determining net income (loss) for the period. The results of operations are translated into U.S. dollars at the average exchange rates during the respective period. We record these gains and losses in other income (expense).

Foreign currency transaction gains and losses are generated from the effects of exchange rate changes on transactions denominated in a currency other than our functional currency, which is the U.S. dollar. Gains and losses on foreign currency transactions are generally required to be recognized in the determination of net income (loss) for the period.

We record these gains and losses in other income (expense).

Revenue recognition.

We recognize revenue from sales of products and billings for costs and fees from government contracts when earned.

Product Sales

Revenue is recognized when, and if, evidence of an arrangement is obtained and the other criteria to support revenue recognition are met, including:

Persuasive evidence of an arrangement exists. We require evidence of a purchase order with the customer specifying the terms and specifications of the product to be delivered, typically in the form of a signed quotation or purchase order from the customer;

Title has passed and the product has been delivered. Title passage and product delivery generally occur when the product is delivered to a common carrier or per terms of a consignment agreement;

The price is fixed or determinable. All terms are fixed in the signed quotation or purchase order received from the customer. The purchase orders do not contain rights of cancellation, return, exchange or refund; and

Collection of the resulting receivable is reasonably assured. Our standard arrangement with customers includes payment terms. Customers are subject to a credit review process that evaluates each customer's financial position and its ability to pay. We determine collectability by considering the length of time the customer has been in business and our history of collections with that customer. If we determine that collection is not probable, no product is shipped and no revenue is recognized unless cash is received in advance.

In July 2012, we signed a contract with the Air Force Research Laboratory (the LANCE government contract) to produce large-area sapphire windows on a cost plus fixed fee basis. We recognize revenue from this contract in the period during which the related costs are incurred over the contractually defined period. We record revenue on a gross basis as costs are incurred plus a portion of the fixed fee. The contract will not be fully completed until our subcontractors complete the polishing of the windows. We expect to complete our contract in 2019.

We do not provide maintenance or other services and we do not have sales that involve multiple elements or deliverables.

All of our revenue is denominated in U.S. dollars.

Inventory valuation

We value our inventory at the lower of cost or net realizable value. Market cost is determined based on net realizable value. Raw materials cost is determined using the first-in, first-out method, and work-in-process and finished goods costs are determined on a standard cost basis which includes materials, labor and overhead. We establish inventory reserves when conditions exist that suggest inventory may be in excess of anticipated demand or is obsolete based on customer required specifications. We evaluate the ability to realize the value of our inventory based on a combination of factors, including forecasted sales, estimated current and future market value and changes in customers' product specifications. For the years ended December 31, 2017 and 2016, we determined we had inventory that was excess or obsolete and recorded an adjustment which reduced inventory and increased costs of goods sold by \$1.4 million and \$130,000, respectively. At times in 2017 and 2016, we accepted sales orders for core and wafer products at prices lower than our cost. Based on these sales prices, we recorded for the years ended December 31, 2017 and 2016, a lower of cost or market adjustment which reduced inventory and increased cost of goods sold by \$97,000 and \$1.1 million, respectively.

In connection with the closing of our Malaysia facility and exiting the LED market, we determined we had excess two-inch core inventory and recorded a write-down of \$2.3 million for the year ended December 31, 2016. We also recorded for the year ended December 31, 2016, a write-down of excess raw material inventory of \$4.0 million and consumable stock write-down expense of \$3.2 million. For the year ended December 31, 2017, we recorded additional write-down of excess raw material inventory of \$2.4 million, excess two-inch core inventory write-down of \$310,000 and consumable stock write-down of \$256,000.

In addition, for the year ended December 31, 2017, we determined we had excess inventory of lower quality sapphire crystals and recorded an adjustment which reduced inventory and increased cost of goods sold by \$451,000.

Our method of estimating excess and obsolete inventory has remained consistent for all periods presented. If our recognition of excess or obsolete inventory is, or if our estimates of our inventory's potential utility become, less favorable than currently expected, additional inventory reserves may be required.

We determine our normal operating capacity and record as an expense costs attributable to lower utilization of equipment and staff. For the years ended December 31, 2017 and 2016, we determined that we were not operating at capacity and recorded costs associated with lower utilization of equipment and staff of \$2.1 million and \$9.4 million, respectively.

Investments

We invest available cash primarily in investment grade commercial paper, FDIC guaranteed certificates of deposits, corporate notes, common stock and government securities. Investments classified as available-for-sale securities are carried at fair market value with unrealized gains and losses recorded in accumulated other comprehensive income (loss). Investments in trading securities are reported at fair value, with both realized and unrealized gains and losses recorded in other income (expense), in the Consolidated Statements of Operations. Investments in which we have the ability and intent, if necessary, to liquidate in order to support our current operations are classified as short-term.

We review our available-for-sale securities investments at the end of each quarter for other-than-temporary declines in fair value based on the specific identification method. We consider various factors in determining whether an impairment is other-than-temporary, including the severity and duration of the impairment, changes in underlying credit ratings, forecasted recovery, our ability and intent to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value and the probability that the scheduled cash payments will continue to be made. When we conclude that an other-than-temporary impairment has resulted, the difference between the fair value and carrying value is written off and recorded as a charge on the Consolidated Statement of Operations. As of December 31, 2017 and 2016, no impairment was recorded.

Allowance for doubtful accounts

We estimate the allowance for doubtful accounts based on an assessment of the collectability of specific customer accounts. The determination of risk for collection is assessed on a customer-by-customer basis considering our historical experience and expected future orders with the customer, changes in payment patterns and recent information we have about the current status of our accounts receivable balances. If we determine that a specific customer is a risk for collection, we provide a specific allowance for credit losses to reduce the net recognized receivable to the amount we reasonably believe will be collected. If a receivable is deemed uncollectible, and the account balance differs from the allowance provided, the specific amount is written off to bad debt expense. We believe that based on the customers to whom we sell and the nature of our agreements with them, our estimates are reasonable. Our method of estimating collectability has remained consistent for all periods presented and with past collections experience.

Long-lived assets

When circumstances, such as adverse market conditions, indicate that the carrying value of a long-lived asset may be impaired, we perform an analysis to review the recoverability of the asset's carrying value using estimates of the undiscounted cash flows (excluding interest charges) from the expected future operations of the asset. These estimates consider factors such as expected future operating income, operating trends and prospects, as well as the effects of

demand, competition and other factors. If the analysis indicates that the carrying value is not recoverable from future cash flows, an impairment loss is recognized to the extent that the carrying value exceeds the estimated fair value. The estimated fair value of assets is determined using appraisal techniques which assume the highest and best use of the asset by market participants, considering the use of the asset that is physically possible, legally permissible, and financially feasible at the measurement date. Any impairment losses are recorded as operating expenses, which reduce net income.

In connection with our decision to limit our focus to the optical and industrial sapphire markets, exit the LED market and close our Malaysia facility, in the fourth quarter of 2016, we developed a plan to scale down the remaining operations and sell additional assets that would not be needed. We engaged an independent valuation company to assist in the determination of the fair value of assets to provide an updated valuation of our U.S. and Malaysia machinery and equipment. We evaluated our U.S. asset portfolio for the assets continuing to be used in operations using a cost and market approach to determine the current fair value. Additionally, we determined we had excess U.S. machinery, equipment and facilities than needed for our current business strategy. We evaluated our excess U.S. assets and Malaysia asset portfolio based on assuming an orderly liquidation plan which considers economic obsolescence and sales of comparable equipment, as it is our intention to sell these assets. Based on this review, we recorded for the year ended December 31, 2016 an asset impairment charge on U.S. and Malaysia machinery and equipment of \$12.3 million.

At September 30, 2017, we reviewed the current fair value of our assets. With the scaling down of our U.S. operations, we identified at September 30, 2017, additional assets that will not be needed. We reduced the net book value of certain machinery and equipment and recorded an asset impairment charge of \$675,000. At December 31, 2017, we reviewed the current fair value of our U.S. and Malaysia machinery and equipment. We recorded an impairment charge of \$354,000 on lower expected sales prices for assets held for sale and identification of additional assets that will not be needed to support our current operations.

We are actively pursuing the sale or lease of our 134,400 square foot manufacturing and office facility in Batavia, Illinois, a parcel of extra land we own in Batavia, Illinois, and the sale of our 65,000 square foot facility in Penang, Malaysia. Since the expected sale price is below the book value of these properties, for the year ended December 31, 2016, we recorded an impairment charge of \$14.3 million. For the year ended December 31, 2017, the expected sale price for the Batavia, Illinois facility and parcel of extra land was further reduced resulting in recording an additional impairment charge of \$4.0 million.

We will continue to assess our long-lived assets to ensure the carrying amount of these assets is still appropriate given any changes in the asset usage, marketplace and other factors used in determining the current fair value. We cannot guarantee that we will be able to successfully complete the sale or lease of any assets.

Stock-based compensation

We grant stock-based compensation in the form of stock options, restricted stock units (“RSUs”) and restricted stock. We expense stock options based upon the fair value on the date of grant. We use the Black-Scholes option pricing model to determine the fair value of stock options. The determination of the fair value of stock-based payment awards on the date of grant using an option-pricing model is affected by assumptions regarding a number of complex and subjective variables. These variables include our expected stock volatility over the term of the awards, actual and

projected employee stock option exercise behaviors, risk-free interest rates, forfeitures and expected dividends.

The expected term represents the weighted-average period that our stock options are expected to be outstanding and is based upon five years of historical data. We estimate the volatility of our common stock based on a five-year historical stock price. We base the risk-free interest rate that we use in the option pricing model on U.S. Treasury zero-coupon issues with remaining terms similar to the expected term on the options. We do not anticipate paying any cash dividends in the foreseeable future and, therefore, use an expected dividend yield of zero in the option pricing model. We are required to estimate forfeitures at the time of grant and revise those estimates in subsequent periods if actual forfeitures differ from those estimates. The current forfeiture rate of 23.1% was based on our past history of forfeitures.

All stock options are granted at an exercise price per share equal to the closing market price of our common stock on the last market trading day prior to the date of grant. Therefore, there is no intrinsic value because the exercise price per share of each option was equal to the fair value of the common stock on the date of grant.

Based on the fair market value of the common stock at December 31, 2017, there is no aggregate intrinsic value of all stock options outstanding and exercisable.

We used a Monte Carlo simulation model valuation technique to determine the fair value of 59,098 RSUs granted in March 2017 to a key executive pursuant to an employment agreement, because the awards vest based upon achievement of market price targets of our common stock. The Monte Carlo simulation model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the award and calculates the fair value of each RSU. We used the following assumptions in determining the fair value of the RSUs:

| | |
|---------------------------------------|------------|
| Daily expected stock price volatility | 4.4237 % |
| Daily expected mean return on equity | (0.2226 %) |
| Daily expected dividend yield | 0.0 % |
| Average daily risk free interest rate | 0.0063 % |

The daily expected stock price volatility is based on a four-year historical volatility of our common stock. The daily expected dividend yield is based on annual expected dividend payments. The average daily risk-free interest rate is based on the three-year treasury yield as of the grant date. Each of the tranches is calculated to have its own fair value and requisite service period. The fair value of each tranche is amortized over the requisite or derived service period, which is up to four years. These RSUs had a grant date fair value of \$322,623. During the year ended December 31, 2017, the first three out of the four tranches of the grant vested.

We allocate stock based compensation costs using a straight-line method which amortizes the fair value of each option on a straight-line basis over the service period. Based on the variables affecting the valuation of our common stock and the method used for allocating compensation costs, we recognized \$897,000 and \$1.3 million in stock compensation expense in each of the years ended December 31, 2017 and 2016, respectively.

For more information on stock-based compensation, see Note 7 – Stock Incentive Plans to our Consolidated Financial Statements included in this Annual Report on Form 10-K.

Income tax valuation allowance

Evaluating the need for and amount of a valuation allowance for deferred tax assets often requires significant judgment and extensive analysis of all the positive and negative evidence available to determine whether all or some portion of the deferred tax assets will not be realized. A valuation allowance must be established for deferred tax assets when it is more likely than not (a probability level of more than 50%) that they will not be realized. In general, “realization” refers to the incremental benefit achieved through the reduction in future taxes payable or an increase in future taxes refundable from the deferred tax assets, assuming that the underlying deductible differences and

carryforwards are the last items to enter into the determination of future taxable income. In determining our valuation allowance, we consider the source of taxable income including taxable income in prior carryback years, future reversals of existing temporary differences, the required use of tax planning strategies, and future taxable income exclusive of reversing temporary differences and carryforwards. We are in a cumulative loss position for the past three years which is considered significant negative evidence that is difficult to overcome on a “more likely than not” standard through objectively verifiable data. Under the accounting standards verifiable evidence will have greater weight than subjective evidence such as our projections for future growth. Based on an evaluation in accordance with the accounting standards, as of December 31, 2017, a valuation allowance has been recorded against the net U.S. and Malaysia deferred tax assets in order to measure only the portion of the deferred tax assets that are more likely than not to be realized based on the weight of all the available evidence. Any U.S. and Malaysia tax benefits or tax expense recorded on the Consolidated Statement of Operations will be offset with a corresponding valuation allowance until such time that we change our determination related to the realization of deferred tax assets. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

Accounting for uncertainty in income taxes

We recognize the tax benefit from an uncertain tax position only if it is more likely than not the tax position will be sustained on examination by the taxing authorities, based on the technical merits of the position. The tax benefits recognized in the financial statements from such positions are then measured based on the largest benefit that has a greater than 50% likelihood of being realized upon settlement. At December 31, 2017 and 2016, we had unrecognized tax benefits taken or expected to be taken in a tax return that have been recorded on our financial statements of \$1.1 million that are related to tax positions taken in 2012. We recognize interest and/or penalties related to income tax matters in income tax expense. There were no interest or penalties related to income taxes that have been accrued or recognized as of and for the years ended December 31, 2017 and 2016.

We are subject to taxation in the U.S. and in a state jurisdiction. We are exempt from Malaysian income tax for a five-year period beginning in 2009 with a five-year renewal. As of the December 31, 2016, we requested the Malaysian government to modify the tax holiday to allow us to extend through 2016, even though we did not meet the original requirements. Due to the uncertainty of the modification being granted, at December 31, 2016, we recorded a current income tax provision for Malaysia income taxes with the expectation that the holiday will not be granted. During 2017, we were granted approval for extension of the holiday and the provision was reversed. Due to the existence of net operating loss carryforwards, tax years ended December 31, 2001 through 2006, 2008, 2009 and 2011 through 2016 are open to examination by tax authorities for Federal purposes. Due to net operating loss carryforwards at the State level, tax years ended 2004 through 2006 and 2008 through 2016 are open to examination by state tax authorities. Tax years 2013 through 2016 are open to examination by the Malaysia Inland Revenue Board.

RECENT ACCOUNTING PRONOUNCEMENTS

See Note 1 to the Consolidated Financial Statements for a discussion of new accounting standards.

OFF-BALANCE SHEET ARRANGEMENTS

None.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Disclosure under this item is not required as the registrant is a smaller reporting company.

ITEM 8. CONSOLIDATED FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Our Consolidated Financial Statements, together with the related notes and the report of independent registered public accounting firm, are set forth on the pages indicated in Item 15 of this Annual Report on Form 10-K and are incorporated by reference herein.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURES.

None.

ITEM 9A. CONTROLS AND PROCEDURES

Management's Evaluation of Disclosure Controls and Procedures.

An evaluation was performed under the supervision and with the participation of our management, including our chief executive officer and chief financial officer (together, our “certifying officers”), of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) as of the end of the year covered by this report. Disclosure controls and procedures are controls and other procedures designed to ensure that information required to be disclosed by us in our periodic reports filed with the SEC is recorded, processed, summarized and reported within the time periods specified by the SEC’s rules and forms, and that the information is accumulated and communicated to our management, including the chief executive officer and chief financial officer, as appropriate to allow timely decisions regarding required disclosure. Based on their evaluation, our certifying officers concluded that these disclosure controls and procedures were effective as of December 31, 2017.

Management’s Report on Internal Control over Financial Reporting

The financial statements were prepared by management, which is responsible for their integrity and objectivity and for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f).

The Company’s internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. The Company’s internal control over financial reporting includes those policies and procedures that:

- i. pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and disposition of the assets of the Company;
- ii. provide reasonable assurance that transactions are recorded as necessary to permit preparation of Consolidated Financial Statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and

... provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or
iii. disposition of the Company's assets that could have a material effect on the Consolidated Financial Statements.

There are inherent limitations in the effectiveness of any internal control, including the possibility of human error and the circumvention or overriding of controls. Accordingly, even effective internal controls can provide only reasonable assurance with respect to the financial statement preparation. Further, because of changes in conditions, the effectiveness of internal controls may vary over time.

Management assessed the design and effectiveness of the Company's internal control over financial reporting as of December 31, 2017. In making this assessment, management used the criteria set forth in 2013 *Internal Control—Integrated Framework* by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Based on management's assessment using those criteria, as of December 31, 2017, management concluded that the Company's internal control over financial reporting was effective.

Rubicon Technology, Inc.

March 20, 2018

This annual report does not include an attestation report of our registered public accounting firm regarding internal control over financial reporting. Management's report was not subject to attestation by our registered public accounting firm pursuant to rules of the SEC that permit the Company to provide only management's report in this annual report.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2017 that our certifying officers concluded materially affected, or are reasonably likely to materially affect, our internal controls over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

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PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The Information required by Items 401, 405, 407(d)(4) and 407(d)(5) of Regulation S-K will be included under the captions “Proposal 1: Election of Directors,” “Executive Compensation – Executive Officers,” “Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters – Section 16(a) Beneficial Ownership Reporting Compliance” and “Corporate Governance – Committees of the Board of Directors and Meetings – Audit Committee” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. If such proxy statement is not filed with the SEC within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed not later than the end of such 120-day period.

We have adopted a Code of Ethics that applies to all of our employees, officers and directors. A copy of the Code of Ethics is available on our website at www.rubicontechnology.com, and any waiver from the Code of Ethics will be timely disclosed on the Company’s website as will any amendments to the Code of Ethics.

ITEM 11. EXECUTIVE COMPENSATION

The information required by Item 402 of Regulation S-K will be included under the captions “Executive Compensation” and “Director Compensation” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. If such proxy statement is not filed with the SEC within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed not later than the end of such 120-day period.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Securities Authorized for Issuance under Equity Compensation Plans

The following table represents securities authorized for issuance under, the Rubicon Technology Inc. 2007 Stock Incentive Plan, as amended and restated, and the Rubicon Technology Inc. 2016 Stock Incentive Plan as of December 31, 2017.

Equity Compensation Plan Information

| Plan Category | Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights | Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights | Number of Securities Remaining Available for Future Issuances Under the Equity Compensation Plans (Excluding Securities Reflected in Column (a)) |
|---|--|---|--|
| | (a) | (b) | (c) |
| Equity compensation plans approved by security holders ⁽¹⁾ | 147,948 | \$ 19.53 | 274,494 |

(1) The Rubicon Technology Inc. 2007 Stock Incentive Plan was approved by stockholders before our initial public offering.

The information required by Item 403 of Regulation S-K will be included under the caption “Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. If such proxy statement is not filed with the SEC within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed not later than the end of such 120-day period.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by Item 404 of Regulation S-K will be included under the caption “Certain Relationships and Related Party Transactions” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. The information required by Item 407(a) of Regulation S-K will be included under the caption “Corporate Governance - Director Independence” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. If such proxy statement is not filed with the SEC within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed not later than the end of such 120-day period.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item will be included under the caption “Ratification of Selection of Independent Registered Public Accounting Firm” in our proxy statement for our 2018 Annual Meeting of Stockholders and is incorporated by reference herein. If such proxy statement is not filed with the SEC within 120 days after the end of the fiscal year covered by this Form 10-K, an amendment to this Form 10-K shall be filed not later than the end of such 120-day period.

PART IV

ITEM 15. EXHIBITS AND CONSOLIDATED FINANCIAL STATEMENT SCHEDULES

(a) Financial statements. The following Consolidated Financial Statements are filed as part of this Annual Report on Form 10-K.

| | Page |
|--|-------------|
| <u>Reports of Independent Registered Public Accounting Firms</u> | F-2 |
| <u>Consolidated Balance Sheets as of December 31, 2017 and 2016</u> | F-4 |
| <u>Consolidated Statements of Operations for each of the two years in the period ended December 31, 2017</u> | F-5 |
| <u>Consolidated Statements of Comprehensive Loss for each of the two years in the period ended December 31, 2017</u> | F-6 |
| <u>Consolidated Statements of Stockholders' Equity for each of the two years in the period ended December 31, 2017</u> | F-7 |
| <u>Consolidated Statements of Cash Flows for each of the two years in the period ended December 31, 2017</u> | F-8 |
| <u>Notes to Consolidated Financial Statements</u> | F-9 |

(b) Exhibits. The exhibits filed or incorporated by reference as a part of this report are listed in the Index to Exhibits which appears following the signature page to this Annual Report on Form 10-K and are incorporated by reference.

(c) Financial statement schedules not listed above have been omitted because they are inapplicable, are not required under applicable provisions of Regulation S-X, or the information that would otherwise be included in such schedules is contained in the registrant's financial statements or accompanying notes.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on March 20, 2018.

Rubicon Technology, Inc.

By/s/ Timothy E. Brog
Timothy E. Brog

President and Chief Executive Officer

KNOWN BY ALL MEN BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Timothy E. Brog and Mardel A. Graffy, jointly and severally, his or her attorney-in-fact, with the power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his or her substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated on March 20, 2018.

| Signature | Title |
|--|--|
| /s/ Timothy E. Brog Timothy E. Brog | Director, President and Chief Executive Officer (Principal Executive Officer) |
| /s/ Mardel A. Graffy Mardel A. Graffy | Chief Financial Officer (Principal Financial and Accounting Officer) |
| /s/ Michael E. Mikolajczyk Michael E. Mikolajczyk | Chairman of the Board of Directors |
| /s/ Susan Westphal Susan Westphal | Director |
| /s/ Jefferson Gramm Jefferson Gramm | Director |

EXHIBIT INDEX

The Exhibits listed below are filed or incorporated by reference as part of this Annual Report on Form 10-K.

| Exhibit No. | Description | Incorporation by Reference |
|--------------------|---|--|
| 3.1 | <u>Eighth Amended and Restated Certificate of Incorporation of Rubicon Technology, Inc.</u> | <u>Filed as Exhibit 3.1 to the registrant's Registration Statement on Form S-1/A, filed on November 1, 2007 (File No. 333-145880)</u> |
| 3.2 | <u>Amendment No. 1 to Eighth Amended and Restated Certificate of Incorporation of Rubicon Technology, Inc.</u> | <u>Filed as Appendix A to the registrant's Definitive Proxy Statement on Schedule 14A, filed on April 29, 2011 (File No. 1-33834)</u> |
| 3.3 | <u>Certificate of Amendment to Eighth Amended and Restated Certificate of Incorporation of Rubicon Technology, Inc.</u> | <u>Filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K, filed on May 4, 2017 (File No. 1-33834)</u> |
| 3.4 | <u>Second Amended and Restated Bylaws of Rubicon Technology, Inc.</u> | <u>Filed as Exhibit 3.3 to the registrant's Quarterly Report on Form 10-Q, filed on May 10, 2016 (File No. 1-33834)</u> |
| 3.5 | <u>Certificate of Designations of Series A Junior Participating Preferred Stock of Rubicon Technology, Inc. filed with the Secretary of State of Delaware on December 18, 2017.</u> | <u>Filed as Exhibit 3.1 to the registrant's Current Report on Form 8-K, filed on December 18, 2017 (File No. 1-33834)</u> |
| 4.1 | <u>Specimen Common Stock Certificate</u> | <u>Filed as Exhibit 4.1 to the registrant's Registration Statement on Form S-1/A, filed on November 13, 2007 (File No. 333-145880)</u> |
| 4.2 | <u>Rights Agreement dated as of December 18, 2017, between Rubicon Technology, Inc. and American Stock Transfer & Trust Company, LLC, which includes the Form of Certificate of Designations of Series A Junior Participating Preferred Stock as Exhibit A, the Form of Right Certificate as Exhibit B and the Summary of Rights to Purchase Preferred Shares as Exhibit C.</u> | <u>Filed as Exhibit 4.1 to the registrant's Current Report on Form 8-K, filed on December 18, 2017 (File No. 1-33834)</u> |
| 10.1* | <u>Rubicon Technology, Inc. 2001 Equity Plan, dated as of August 2, 2001</u> | <u>Filed as Exhibit 10.1 to the registrant's Registration Statement on Form S-1, filed</u> |

| | | |
|----------|--|--|
| | | <u>on September 5, 2007</u> <u>(File No. 333-145880)</u> |
| 10.1(a)* | <u>Amendment No. 1 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of November 6, 2001</u> | <u>Filed as Exhibit 10.1(a) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(b)* | <u>Amendment No. 2 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of May 21, 2002</u> | <u>Filed as Exhibit 10.1(b) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(c)* | <u>Amendment No. 3 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of May 28, 2004</u> | <u>Filed as Exhibit 10.1(c) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(d)* | <u>Amendment No. 4 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of December 6, 2004</u> | <u>Filed as Exhibit 10.1(d) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(e)* | <u>Amendment No. 5 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of June 28, 2005</u> | <u>Filed as Exhibit 10.1(e) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(f)* | <u>Amendment No. 6 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of November 30, 2005</u> | <u>Filed as Exhibit 10.1(f) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(g)* | <u>Amendment No. 7 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of July 26, 2006</u> | <u>Filed as Exhibit 10.1(g) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.1(h)* | <u>Rubicon Technology, Inc. 2001 Equity Plan Form of Notice of Stock Option Grant and Stock Option Agreement</u> | <u>Filed as Exhibit 10.1(h) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.2* | <u>Rubicon Technology, Inc. 2007 Stock Incentive Plan, as amended and restated, effective March 23, 2011</u> | <u>Filed as Exhibit 10.2 to the registrant's Annual Report on Form 10-K, filed on March 13, 2014 (File No. 1-33834)</u> |

| Exhibit No. | Description | Incorporation by Reference |
|-------------|--|--|
| 10.3* | <u>Rubicon Technology, Inc. 2016 Stock Incentive Plan</u> | <u>Filed as Appendix A to the registrant's Definitive Proxy Statement on Schedule 14A, filed on May 18, 2016 (File No. 1-33834)</u> |
| 10.3(a)* | <u>Form of Notice of Stock Option Grant and Stock Option Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan</u> | <u>Filed as Exhibit 10.2 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)</u> |
| 10.3(b)* | <u>Form of Non-Employee Director Restricted Stock Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan</u> | <u>Filed as Exhibit 10.3 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)</u> |
| 10.3(c)* | <u>Form of Restricted Stock Unit Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan (with time-based vesting)</u> | <u>Filed as Exhibit 10.4 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)</u> |
| 10.4* | <u>Form of Indemnification Agreement for Directors and Officers</u> | <u>Filed as Exhibit 10.11 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.5* | <u>Form of Indemnification Agreement for Directors and Executive Officers</u> | <u>Filed as Exhibit 10.1 to the registrant's Quarterly Report on Form 10-Q, filed on May 8, 2015 (File No. 1-33834)</u> |
| 10.6* | <u>Executive Employment Agreement by and between Rubicon Technology, Inc. and William F. Weissman, dated as of February 18, 2015</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on February 19, 2015 (File No. 1-33834)</u> |
| 10.6(a)* | <u>First Amendment to Executive Employment Agreement by and between Rubicon Technology, Inc. and William F. Weissman, dated as of December 1, 2015</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on December 4, 2015 (File No. 1-33834)</u> |
| 10.6(b)* | <u>Separation Agreement between Rubicon Technology, Inc. and William F. Weissman, dated as of March 16, 2017</u> | <u>Filed as Exhibit 10.1 to the registrant's Quarterly Report On Form 10-Q filed on May 12, 2017 (File No. 1-33834)</u> |
| 10.7* | <u>Executive Employment Agreement by and between Rubicon Technology, Inc. and Mardel A. Graffy, dated as of February 18, 2015</u> | <u>Filed as Exhibit 10.2 to the registrant's Current Report on Form 8-K, filed on February 19, 2015 (File No. 1-33834)</u> |
| 10.8* | <u>Letter of Appointment by and between Rubicon Sapphire Technology (Malaysia) Sdn. Bhd and Hany Tamim, dated as of October 31, 2015</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K/A, filed on November 5, 2015 (File No. 1-33834)</u> |

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|--------|--|--|
| 10.9* | <u>Executive Employment Agreement by and between Rubicon Technology, Inc. and Timothy E. Brog, dated as of March 1, 2017</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on March 16, 2017 (File No. 1-33834)</u> |
| 10.10* | <u>Amended and Restated Executive Employment Agreement by and between Rubicon Technology, Inc. and Timothy E. Brog, dated as of May 12, 2017</u> | <u>Filed as Exhibit 10.2 to the registrant's Quarterly Report on Form 10-Q, filed on May 12, 2017 (File No. 1-33834)</u> |
| 10.11 | <u>Stockholder's Agreement dated as of November 16, 2017, by and among Rubicon Technology, Inc. and Bandera Partners LLC, Bandera Master Fund L.P., Gregory Bylinsky and Jefferson Gramm</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on November 16, 2017 (File No. 1-33834)</u> |

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| Exhibit No. | Description | Incorporation by Reference |
|-------------|---|---|
| 10.12 | <u>Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of December 23, 2004</u> | <u>Filed as Exhibit 10.12(a) to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.12(a) | <u>Amendment to Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of May 6, 2005</u> | <u>Filed as Exhibit 10.12 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.12(b) | <u>Second Amendment to Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of December 23, 2014</u> | <u>Filed as Exhibit 10.11 to the registrant's Annual Report on Form 10-K, filed on March 13, 2015 (File No. 1-33834)</u> |
| 10.13 | <u>Industrial Building Lease by and between Rubicon Technology, Inc. and Phillip J. Latoria, Jr., dated as of July 18, 2007</u> | <u>Filed as Exhibit 10.14 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)</u> |
| 10.13(a) | <u>Second Amendment to Industrial Building Lease by and between Rubicon Technology, Inc. and Phillip J. Latoria, Jr., dated as of July 17, 2014</u> | <u>Filed as Exhibit 10.13 to the registrant's Annual Report on Form 10-K, filed on March 13, 2015 (File No. 1-33834)</u> |
| 10.14 | <u>Pay-Off Letter effective as of September 9, 2016</u> | <u>Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on September 15, 2016 (File No. 1-33834)</u> |
| 21.1** | <u>Subsidiaries of the Company</u> | |
| 23.1** | <u>Consent of Independent Registered Public Accounting Firm</u> | |
| 23.2** | <u>Consent of Independent Registered Public Accounting Firm</u> | |
| 24.1** | <u>Power of Attorney (incorporated by reference to the signature page of this Annual Report on Form 10-K)</u> | |

| Exhibit No. | Description | Incorporation by Reference |
|-------------|---|----------------------------|
| 31.1** | <u>Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002</u> | |
| 31.2** | <u>Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002</u> | |
| 32.1** | <u>Certifications of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002</u> | |
| 101.INS** | XBRL Instance Document | |
| 101.SCH** | XBRL Taxonomy Extension Schema Document | |
| 101.CAL** | XBRL Taxonomy Extension Calculation Linkbase Document | |
| 101.LAB** | XBRL Taxonomy Extension Label Linkbase Document | |
| 101.PRE** | XBRL Taxonomy Extension Presentation Document | |
| 101.DEF** | XBRL Taxonomy Extension Definition Linkbase Document | |

*Management contract or compensatory plan or arrangement of the Company.

**Submitted electronically with this Annual Report on Form 10-K.

Rubicon Technology, Inc.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors of
Rubicon Technology, Inc. and Subsidiaries

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Rubicon Technology, Inc. and Subsidiaries (the "Company") as of December 31, 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity and cash flows for the year then ended, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017, and the results of its operations and its cash flows for the year then ended, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audit also

included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ Marcum LLP

Marcum llp

We have served as the Company's auditor since 2017.

Chicago, Illinois

March 20, 2018

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders

Rubicon Technology, Inc.

We have audited the accompanying consolidated balance sheet of Rubicon Technology, Inc. (a Delaware corporation) and subsidiaries (the Company) as of December 31, 2016 and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for the year ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audit included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Rubicon Technology, Inc. and subsidiaries as of December 31, 2016, and the results of their operations and their cash flows for the year ended December 31, 2016 in conformity with accounting principles generally accepted in the United States of America.

/s/ GRANT THORNTON LLP

Chicago, Illinois

March 16, 2017, except for the Common Stock section in Note 6, as to which the date is March 20, 2018.

Rubicon Technology, Inc.**Consolidated Balance Sheets**

| | As of December 31, | |
|--|---------------------------------------|-----------|
| | 2017 | 2016 |
| | (in thousands, other than share data) | |
| Assets | | |
| Cash and cash equivalents | \$11,544 | \$17,672 |
| Restricted cash | 181 | 163 |
| Short-term investments | 6,451 | — |
| Accounts receivable, net | 718 | 2,585 |
| Inventories | 3,030 | 8,000 |
| Other inventory supplies | 837 | 1,486 |
| Prepaid expenses and other current assets | 270 | 1,082 |
| Assets held for sale | 11,202 | 14,761 |
| Total current assets | 34,233 | 45,749 |
| Property and equipment, net | 815 | 7,110 |
| Other assets | — | 154 |
| Total assets | \$35,048 | \$53,013 |
| Liabilities and stockholders' equity | | |
| Accounts payable | \$582 | \$948 |
| Accrued payroll | 101 | 182 |
| Accrued and other current liabilities | 430 | 602 |
| Corporate income and franchise taxes | 294 | 568 |
| Accrued real estate taxes | 249 | 241 |
| Advance payments | 59 | 23 |
| Total current liabilities | 1,715 | 2,564 |
| Commitments and contingencies | | |
| Stockholders' equity | | |
| Preferred stock, \$0.001 par value, 5,000,000 undesignated shares authorized, no shares issued or outstanding | — | — |
| Common stock, \$0.001 par value 8,200,000 shares authorized; 2,910,334 and 2,860,367 shares issued; 2,732,850 and 2,682,883 shares outstanding | 29 | 29 |
| Additional paid-in capital | 375,611 | 374,903 |
| Treasury stock, at cost, 177,484 shares | (12,148) | (12,148) |
| Accumulated other comprehensive loss | (3) | (30) |
| Accumulated deficit | (330,156) | (312,305) |
| Total stockholders' equity | 33,333 | 50,449 |
| Total liabilities and stockholders' equity | \$35,048 | \$53,013 |

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

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Rubicon Technology, Inc.**Consolidated Statements of Operations**

| | Year ended December 31, | |
|--|--|-------------|
| | 2017 | 2016 |
| | (in thousands, other than share data) | |
| Revenue | \$5,044 | \$19,630 |
| Cost of goods sold | 10,552 | 45,638 |
| Gross loss | (5,508) | (26,008) |
| Operating expenses: | | |
| General and administrative | 4,510 | 7,695 |
| Sales and marketing | 775 | 1,444 |
| Research and development | 962 | 2,550 |
| Long-lived asset impairment charge | 5,051 | 26,554 |
| Loss (gain) on disposal of assets | 1,118 | (1,534) |
| Loss from operations | (17,924) | (62,717) |
| Other income (expense): | | |
| Interest income | 116 | 73 |
| Interest expense | — | (99) |
| Realized gain (loss) on foreign currency translation | 45 | (359) |
| Total other income (expense) | 161 | (385) |
| Loss before income taxes | (17,763) | (63,102) |
| Income tax (expense) benefit | (88) | 223 |
| Net loss | \$(17,851) | \$(62,879) |
| Net loss per common share | | |
| Basic | \$(6.60) | \$(23.86) |
| Diluted | \$(6.60) | \$(23.86) |
| Weighted average common shares outstanding used in computing net loss per common share | | |
| Basic | 2,702,926 | 2,635,636 |
| Diluted | 2,702,926 | 2,635,636 |

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

Rubicon Technology, Inc.

Consolidated Statements of Comprehensive Loss

| | Year ended | |
|--|----------------|------------|
| | December 31, | |
| | 2017 | 2016 |
| | (in thousands) | |
| Net loss | \$(17,851) | \$(62,879) |
| Other comprehensive income (loss): | | |
| Unrealized gain on investments, net of taxes | 10 | 5 |
| Unrealized gain (loss) on currency translation | 17 | (2) |
| Other comprehensive income | 27 | 3 |
| Comprehensive loss | \$(17,824) | \$(62,876) |

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

Rubicon Technology, Inc.**Consolidated Statements of Stockholders' Equity**

| | Common stock | | Treasury stock | | Additional paid-in capital | Stockholders' equity | | |
|--|--------------------------------------|--------|----------------|------------|----------------------------------|--------------------------------|------------------|----------------------------------|
| | Shares | Amount | Shares | Amount | | Accum other comp inc. | Accum deficit | Total stockholders' equity |
| | (in thousands other than share data) | | | | | | | |
| Balance at January 1, 2016 | 2,800,781 | \$ 28 | (177,484) | \$(12,148) | \$ 373,565 | \$(33) | \$(249,426) | \$ 111,986 |
| Stock-based compensation | — | — | — | — | 527 | — | — | 527 |
| Restricted stock issued, net of restricted shares withheld for employee taxes | 52,990 | 1 | — | — | 558 | — | — | 559 |
| Common stock issued, net of shares withheld for employee taxes | 6,596 | — | — | — | 253 | — | — | 253 |
| Foreign currency translation adjustments | — | — | — | — | — | (2) | — | (2) |
| Unrealized gain on investments, net of tax | — | — | — | — | — | 5 | — | 5 |
| Net loss | — | — | — | — | — | — | (62,879) | (62,879) |
| Balance at December 31, 2016 | 2,860,367 | 29 | (177,484) | (12,148) | 374,903 | (30) | (312,305) | 50,449 |
| Exercise of stock options, net of shares withheld for employee taxes | 168 | — | — | — | (1) | — | — | (1) |
| Stock-based compensation | — | — | — | — | 277 | — | — | 277 |
| Restricted stock issued | 16,496 | — | — | — | 160 | — | — | 160 |
| Common stock issued, net of shares withheld for employee taxes | 33,318 | — | — | — | 272 | — | — | 272 |
| Reverse stock split fractional shares | (15) | — | — | — | — | — | — | — |
| Foreign currency translation adjustments | — | — | — | — | — | 10 | — | 10 |
| Unrealized gain on investments, net of tax | — | — | — | — | — | 17 | — | 17 |
| Net loss | — | — | — | — | — | — | (17,851) | (17,851) |

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| | | | | | | | | |
|---------------------------------|-----------|-------|-----------|------------|-----------|--------|-------------|-----------|
| Balance at December 31, 2017 | 2,910,334 | \$ 29 | (177,484) | \$(12,148) | \$375,611 | \$(3) | \$(330,156) | \$ 33,333 |
|---------------------------------|-----------|-------|-----------|------------|-----------|--------|-------------|-----------|

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

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Rubicon Technology, Inc.**Consolidated Statements of Cash Flows**

| | Year ended December 31, | |
|--|----------------------------|------------|
| | 2017 | 2016 |
| | (in thousands) | |
| Cash flows from operating activities | | |
| Net loss | \$(17,851) | \$(62,879) |
| Adjustments to reconcile net loss to net cash (used in) operating activities | | |
| Depreciation and amortization | 1,173 | 6,100 |
| Net (gain) loss on disposal of assets | 1,118 | (1,534) |
| Stock-based compensation | 897 | 1,348 |
| Long-lived asset impairment charge | 5,051 | 26,554 |
| Deferred taxes | — | (554) |
| Changes in operating assets and liabilities: | | |
| Accounts receivable | 1,867 | (847) |
| Inventories | 4,970 | 13,641 |
| Other inventory supplies | 605 | 4,263 |
| Prepaid expenses and other assets | 978 | 1,304 |
| Accounts payable | (369) | (2,354) |
| Accrued payroll | (85) | 22 |
| Corporate income and franchise taxes | (273) | 360 |
| Accrued real estate taxes | 8 | 2 |
| Advance payments | 36 | 14 |
| Accrued and other current liabilities | (159) | (725) |
| Net cash (used in) operating activities | (2,034) | (15,285) |
| Cash flows from investing activities | | |
| Purchases of property and equipment | — | (704) |
| Proceeds from disposal of assets | 2,561 | 5,344 |
| Purchase of investments | (6,498) | (28) |
| Proceeds from sale of investments | 57 | 8,928 |
| Net cash (used in) provided by investing activities | (3,880) | 13,540 |
| Cash flows from financing activities | | |
| Restricted cash | (18) | 7 |
| Net change in short-term borrowings | — | (1,500) |
| Taxes paid related to net share settlement of equity awards | (189) | (8) |
| Net cash (used in) financing activities | (207) | (1,501) |
| Net effect of currency translation | (7) | (298) |
| Net decrease in cash and cash equivalents | (6,128) | (3,544) |
| Cash and cash equivalents, beginning of year | 17,672 | 21,216 |

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| | | |
|--|----------|----------|
| Cash and cash equivalents, end of year | \$11,544 | \$17,672 |
| Supplemental disclosure of cash flow information | | |
| Cash paid for interest | \$— | \$99 |

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

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Rubicon Technology, Inc.

Notes to Consolidated Financial Statements

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Description of business

Rubicon Technology, Inc., a Delaware corporation (the “Company”), is a vertically integrated, advanced materials provider specializing in monocrystalline sapphire for applications in optical and industrial systems. The Company sells its products on a global basis to customers in Asia, Australia, North America and Europe. The Company maintains its operating facilities in the Chicago metropolitan area.

Principles of consolidation

The Consolidated Financial Statements include the accounts of the Company and its wholly owned subsidiaries, Rubicon Technology Worldwide LLC, Rubicon Sapphire Technology (Malaysia) SDN BHD, and Rubicon Technology Hong Kong Limited. All intercompany transactions and balances have been eliminated in consolidation.

A summary of the Company’s significant accounting policies applied in the preparation of the accompanying Consolidated Financial Statements follows.

Cash and cash equivalents

The Company considers all unrestricted highly liquid investments immediately available to be cash equivalents. Cash equivalents primarily consist of time deposits with banks, unsettled trades and brokerage money market accounts.

Restricted cash

A summary of the Company's restricted cash at December 31, 2017 and 2016 is as follows:

| | As of December 31, | |
|-------------------------|--------------------|--------|
| | 2017 | 2016 |
| | (in thousands) | |
| Certificates of deposit | \$ 5 | \$ 5 |
| Flexible spending funds | 3 | 2 |
| Fixed deposit pledge | 173 | 156 |
| | \$ 181 | \$ 163 |

Foreign currency translation and transactions

Rubicon Technology Worldwide LLC and Rubicon Technology Hong Kong Limited assets and liabilities are translated into U.S. dollars at exchange rates existing at the respective balance sheet dates and capital accounts at historical exchange rates. The results of operations are translated into U.S. dollars at the average exchange rates during the respective period. Translation adjustments resulting from fluctuations in exchange rates for Rubicon Technology Worldwide LLC and Rubicon Technology Hong Kong Limited are recorded as a separate component of accumulated other comprehensive income (loss) within stockholders' equity.

The Company has determined that the functional currency of Rubicon Sapphire Technology (Malaysia) SDN BHD is the U.S. dollar. Rubicon Sapphire Technology (Malaysia) SDN BHD's assets and liabilities are translated into U.S. dollars using the remeasurement method. Non-monetary assets are translated at historical exchange rates and monetary assets are translated at exchange rates existing at the respective balance sheet dates. Translation adjustments for Rubicon Sapphire Technology (Malaysia) SDN BHD are included in determining net income (loss) for the period. The results of operations are translated into U.S. dollars at the average exchange rates during the respective period. The Company records these gains and losses in other income (expense).

Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

Foreign currency transaction gains and losses are generated from the effects of exchange rate changes on transactions denominated in a currency other than the functional currency of the Company, which is the U.S. dollar. Gains and losses on foreign currency transactions are generally required to be recognized in the determination of net income (loss) for the period. The Company records these gains and losses in other income (expense).

Investments

When the Company invests available cash, it primarily invests it in investment grade commercial paper, corporate notes, FDIC guaranteed certificates of deposit, common stock and government securities. Investments classified as available-for-sale securities are carried at fair market value with unrealized gains and losses recorded in accumulated other comprehensive income (loss). Investments in trading securities are reported at fair value, with both realized and unrealized gains and losses recorded in other income (expense), in the consolidated statements of operations. Investments in which the Company has the ability and intent, if necessary, to liquidate are classified as short-term.

The Company reviews its available-for-sale securities investments at the end of each quarter for other-than-temporary declines in fair value based on the specific identification method. The Company considers various factors in determining whether an impairment is other-than-temporary, including the severity and duration of the impairment, changes in underlying credit ratings, forecasted recovery, its ability and intent to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value and the probability that the scheduled cash payments will continue to be made. When the Company concludes that an other-than-temporary impairment has resulted, the difference between the fair value and carrying value is written off and recorded as a charge on the consolidated statements of operations. As of December 31, 2017 and 2016, no impairment was recorded.

Treasury stock

The Company records treasury stock purchases under the cost method whereby the entire cost of the acquired stock is recorded as treasury stock.

Accounts receivable

The majority of the Company's accounts receivable is due from defense sub-contractors, industrial manufacturers, fabricators and resellers. Credit is extended based on an evaluation of the customer's financial condition. Accounts receivable are due based on contract terms and at stated amounts due from customers, net of an allowance for doubtful accounts.

Accounts outstanding longer than the contractual payment terms are considered past due. The Company determines its allowance by considering a number of factors, including the length of time a customer's account is past due, the customer's current ability to pay and the condition of the general economy and industry as a whole. The Company writes off accounts receivable when they are deemed uncollectible and such write-offs, net of payments received, are recorded as a reduction to the allowance.

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

The following table shows the activity of the allowance for doubtful accounts:

| | Year ended December 31, | |
|--------------------------------------|-------------------------|--------|
| | 2017 | 2016 |
| | (in thousands) | |
| Beginning balance | \$ 31 | \$ 389 |
| Charges to costs and expenses | (20) | (235) |
| Accounts write offs, less recoveries | (4) | (123) |
| Ending balance | \$ 7 | \$ 31 |

Inventories

Inventories are valued at the lower of cost or net realizable value. Raw materials cost is determined using the first-in, first-out method, and work-in-process and finished goods costs are determined on a standard cost basis, which includes materials, labor and overhead. The Company reduces the carrying value of its inventories for differences between the cost and the estimated net realizable value, taking into account usage, expected demand, technological obsolescence and other information.

The Company establishes inventory reserves when conditions exist that suggest inventory may be in excess of anticipated demand or is obsolete based on customer specifications. The Company evaluates the ability to realize the value of its inventory based on a combination of factors, including forecasted sales, estimated current and future market value and changes in customers' product specifications. For the years ended December 31, 2017 and 2016, the Company determined it had excess or obsolete inventory and recorded an adjustment which reduced inventory and increased costs of goods sold by \$1.4 million and \$130,000, respectively. The Company's method of estimating excess and obsolete inventory has remained consistent for all periods presented.

At times in 2017 and 2016, the Company has accepted sales orders for core and wafer products at prices lower than cost. Based on these sales prices, the Company recorded for the years ended December 31 2017 and 2016, a lower of cost or market adjustment which reduced inventory and increased cost of goods sold by \$97,000 and \$1.1 million,

respectively.

Low prices and a worldwide over supply of material has significantly limited the sales of the Company's two-inch diameter core. Therefore, two-inch diameter core is considered to be in excess. Since it can be recycled and used as raw material to grow new crystals, two-inch diameter core material has been written down to raw material value and for the years ended December 31, 2017 and 2016 an excess and obsolete adjustment was recorded which reduced inventory and increased cost of goods sold by \$310,000 and \$2.3 million, respectively.

With the decision to exit the LED market, the discontinuation of polished and patterned wafer production will result in a significant decrease in crystal growth production and thus impact the amount of raw material needed for future production. Accordingly, raw material in excess of the amount needed for future production has been written down and for the year ended December 31, 2016, an excess and obsolete adjustment was recorded which reduced inventory and increased cost of goods sold by \$4.0 million. The Company evaluates the amount of raw material needed for future production based on expected crystal growth production needed to meet anticipated sales. Based on this review, the Company determined to lower its expected requirements for raw material inventory supply from five to three years and that it had excess material needed for future production. For the year ended December 31, 2017, an excess and obsolete adjustment for raw material was recorded which reduced inventory and increased cost of goods sold by \$2.4 million.

In addition, for the year ended December 31, 2017, the Company determined it had excess inventory of lower quality sapphire crystals and recorded an adjustment which reduced inventory and increased cost of goods sold by \$451,000.

For the years ended December 31, 2017 and 2016, amounts charged to cost of goods sold for all inventory write downs were \$4.7 million and \$7.5 million, respectively.

Inventories are composed of the following:

| | As of | |
|-----------------|----------------|---------|
| | December 31, | |
| | 2017 | 2016 |
| | (in thousands) | |
| Raw materials | \$476 | \$3,112 |
| Work-in-process | 2,334 | 4,251 |
| Finished goods | 220 | 637 |
| | \$3,030 | \$8,000 |

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****Other inventory supplies**

The Company's other inventory supplies include stock of consumable and spare parts used in the manufacturing process. With the decision to focus on optical and industrial products, the Company determined it had consumable parts stock that was obsolete and recorded for the years ended December 31, 2017 and 2016 a consumable stock write-down of \$256,000 and \$3.2 million, respectively.

Property and equipment

Property and equipment consisted of the following:

| | As of December 31, | |
|---|--------------------|----------|
| | 2017 | 2016 |
| | (in thousands) | |
| Machinery, equipment and tooling | \$6,105 | \$17,769 |
| Leasehold improvements | 4,624 | 4,624 |
| Information systems | 819 | 991 |
| Furniture and fixtures | 8 | 699 |
| Construction in progress | — | 263 |
| Total cost | 11,556 | 24,346 |
| Accumulated depreciation and amortization | (10,741) | (17,236) |
| Property and equipment, net | \$815 | \$7,110 |

Property and equipment are carried at cost and depreciated over their estimated useful lives using the straight-line method. The cost of maintenance and repairs is charged to expense as incurred. Significant renewals and improvements are capitalized. Depreciation and amortization expense associated with property and equipment was \$1.2 million and \$6.1 million for the years ended December 31, 2017 and 2016, respectively.

Construction in progress includes costs associated with the construction of furnaces and deposits made on equipment purchases.

The estimated useful lives are as follows:

| Asset description | Life |
|----------------------------------|--|
| Buildings | 39 years |
| Machinery, equipment and tooling | 3-10 years |
| Leasehold improvements | Lesser of life of lease or economic life |
| Furniture and fixtures | 7 years |
| Information systems | 3 years |

Other assets

The Company's other assets include overhaul costs that are accounted for using the deferral method. These overhaul costs are recorded at cost on the balance sheet as other assets and are amortized over terms in accordance with their respectful useful lives.

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****Warranty cost**

The Company's sales terms include a warranty that its products will meet certain specifications. The Company records a current liability for the expected cost of warranty-related claims at the time of sale. The warranty reserve is included in accrued and other current liabilities on the Consolidated Balance Sheets.

The following table presents changes in the Company's product warranty liability:

| | Year ended December 31, | |
|--------------------------------------|-------------------------|-------|
| | 2017 | 2016 |
| | (in thousands) | |
| Balance, beginning of period | \$ 27 | \$ 73 |
| Charged to cost of sales | 20 | (1) |
| Actual product warranty expenditures | (32) | (45) |
| Balance, end of period | \$ 15 | \$ 27 |

Fair value of financial instruments

The Company's financial instruments consist primarily of cash and cash equivalents, short-term investments, accounts receivable, and accounts payable. The carrying values of these assets and liabilities approximate their fair values due to the short-term nature of these instruments at December 31, 2017 and 2016.

Concentration of credit risks and other risks and uncertainties

Financial instruments that could potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents, restricted cash, short term investments and accounts receivable. At December 31, 2017 and

2016, the Company had \$1.2 million and \$681,000, respectively, on deposit at foreign financial institutions. At December 31, 2017 and 2016, the Company had \$6.8 million and \$6.4 million, respectively, on deposit at financial institutions in excess of amounts insured by the Federal Deposit Insurance Corporation and other foreign governmental insurance agencies. The Company performs a periodic evaluation of these institutions for relative credit standing. The Company has not experienced any losses in such accounts and management believes it is not exposed to any significant risk of loss on these balances.

The Company uses third parties for certain finishing functions for its products, including the slicing and polishing of its sapphire crystal inventory. These types of services are only available from a limited number of third parties. The Company's ability to successfully outsource these finishing functions will substantially depend on its ability to develop, maintain and expand its strategic relationship with these third parties. As a result, the Company may be unable to meet the demand for its products, which could have a material adverse impact on the Company.

Concentration of credit risk related to revenue and accounts receivable is discussed in Note 4.

Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

Revenue recognition

Revenues recognized include product sales and billings for costs and fees for government contracts.

Product Sales

The Company recognizes revenue from product sales when earned. Revenue is recognized when, and if, evidence of an arrangement is obtained and the other criteria to support revenue recognition are met, including:

Persuasive evidence of an arrangement exists. The Company requires evidence of a purchase order with the customer specifying the terms and specifications of the product to be delivered, typically in the form of a signed quotation or purchase order from the customer;

Title has passed and the product has been delivered. Title passage and product delivery generally occur when the product is delivered to a common carrier or per terms of a consignment agreement;

The price is fixed or determinable. All terms are fixed in the signed quotation or purchase order received from the customer. The purchase orders do not contain rights of cancellation, return, exchange or refund; and

Collection of the resulting receivable is reasonably assured. The Company's standard arrangement with customers includes payment terms. Customers are subject to a credit review process that evaluates each customer's financial position and its ability to pay. Collectability is determined by considering the length of time the customer has been in business and history of collections. If it is determined that collection is not probable, no product is shipped and no revenue is recognized unless cash is received in advance.

Government Contracts

The Company recognizes research and development revenue in the period during which the related costs are incurred over the contractually defined period. In July 2012, the Company signed a contract with the Air Force Research Laboratory (the LANCE government contract) to produce large-area sapphire windows on a cost plus fixed fee basis. The Company records revenue on a gross basis as costs are incurred plus a portion of the fixed fee. For the years ended December 31, 2017 and 2016, \$394,000 and \$289,000, respectively, of revenue was recorded. At December 31, 2017 and 2016, the estimated costs to complete the contract were in excess of the contract value. For the years ended December 31, 2017 and 2016, the Company accrued \$26,000 and \$217,000, respectively for the estimated costs of completion. To date, the Company has recorded \$4.7 million in revenue and the total value of the contract is \$4.7 million.

The Company does not provide maintenance or other services and it does not have sales that involve multiple elements or deliverables.

Shipping and handling costs

The Company records costs incurred in connection with shipping and handling of products as cost of goods sold. Amounts billed to customers in connection with these costs are included in revenue and are not material for any of the periods presented in the accompanying financial statements.

Sales tax

The Company collects and remits sales taxes on products sold to customers and reports such amounts under the net method in its Consolidated Statements of Operations and records a liability until remitted to the respective tax authority.

Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

Stock-based compensation

The Company requires all share-based payments to employees, including grants of employee stock options to be measured at fair value and expensed in the Consolidated Statements of Operations over the service period (generally the vesting period) of the grant. Expense is recognized in the Consolidated Statements of Operations for these share-based payments.

Research and development

Research and development costs are expensed as incurred. Research and development expense was \$962,000 and \$2.5 million for the years ended December 31, 2017 and 2016, respectively.

Accounting for uncertainty in income taxes

The Company recognizes the tax benefit from an uncertain tax position only if it is more likely than not the tax position will be sustained on examination by the taxing authorities, based on the technical merits of the position. The tax benefits recognized in the financial statements from such positions are then measured based on the largest benefit that has a greater than 50% likelihood of being realized upon settlement. The Company recognizes interest and/or penalties related to income tax matters in income tax expense. There were no interest or penalties related to income taxes that have been accrued or recognized as of and for the years ended December 31, 2017 and 2016.

The Company is subject to taxation in the U.S. and in a state jurisdiction. The Company is exempt from Malaysian income tax for a five-year period beginning in 2009 with a five-year renewal. As of December 31, 2016, the Company requested the Malaysian government to modify the tax holiday to allow it to extend through 2016 even though the Company did not meet the original requirements. Due to the uncertainty of the modification being granted, at December 31, 2016 the Company recorded a current income tax provision for Malaysia income taxes with the expectation that the holiday will not be granted. During 2017, the Company was granted approval for extension of the

holiday and the provision was reversed. Due to the existence of net operating loss carryforwards, tax years ended December 31, 2001 through 2006, 2008, 2009 and 2011 through 2016 are open to examination by tax authorities for Federal purposes. Due to net operating loss carryforwards at the State level, tax years ended 2004 through 2006 and 2008 through 2016 are open to examination by state tax authorities. Tax years 2013 through 2016 are open to examination by tax authorities in Malaysia.

Income taxes

Deferred tax assets and liabilities are provided for temporary differences between financial reporting and income tax bases of assets and liabilities, and are measured using the enacted tax rates and laws expected to be in effect when the differences will reverse. Deferred income taxes also arise from the future benefits of net operating loss carryforwards. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized. Full valuation allowances on net deferred tax assets are maintained until an appropriate level of profitability that generates taxable income is deemed sustainable or until a tax strategy is developed that would enable the Company to conclude that it is more likely than not that a portion of the deferred tax assets will be realizable. Based on an evaluation in accordance with the accounting standards, as of December 31, 2017 and 2016, a valuation allowance has been recorded against the net U.S. and Malaysia deferred tax assets in order to measure only the portion of the deferred tax assets that are more likely than not to be realized based on the weight of all the available evidence.

Use of estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America (“U.S. 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. Actual results could differ from those estimates.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****Other comprehensive loss**

Comprehensive loss is defined as the change in equity of a business enterprise from transactions and other events from non-owner sources. Comprehensive loss includes net loss and other non-owner changes in equity that bypass the statement of operations and are reported in a separate component of equity. A summary of the components of comprehensive loss for the years ended December 31, 2017 and 2016 follows:

| | Year Ended December 31, | |
|--|-------------------------|----------|
| | 2017 | 2016 |
| | (in thousands) | |
| Unrealized loss on investments, net of tax | \$ (2) | \$ (12) |
| Unrealized loss on currency translation | (1) | (18) |
| Ending balance | \$ (3) | \$ (30) |

Net loss per common share

Basic net loss per share is computed by dividing net loss by the weighted average number of common shares outstanding during the period. Diluted net loss per common share is computed by dividing net loss by the weighted average number of diluted common shares outstanding during the period. Diluted shares outstanding are calculated by adding to the weighted shares outstanding any common stock equivalents, outstanding stock options and warrants based on the treasury stock method.

Diluted net loss per common share is the same as basic net loss per common share for the years ended December 31, 2017 and 2016 because the effects of potentially dilutive securities are anti-dilutive.

New accounting pronouncements adopted

In March 2016, the FASB issued ASU No. 2016-09 (“ASU 2016-09”), *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* which modifies several aspects of the accounting for share-based payment transactions, including income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The Company adopted ASU 2016-09 at January 1, 2017, and the impact of adopting ASU 2016-09 for the twelve months ended December 31, 2017 was that the Company was required to bring the deferred tax assets related to off balance net operating losses onto the balance sheet. This increased the Company’s deferred tax assets by \$10.3 million with a corresponding entry to retained earnings. Since the Company continues to be in a full valuation allowance, there was an entry made to the valuation allowance to offset the increase to the deferred tax assets with a corresponding entry to retained earnings.

Recent accounting pronouncements

In February 2016, the FASB issued ASU No. 2016-02 (“ASU 2016-02”), *Leases (Topic 842)* which modifies the lease recognition requirements and requires entities to recognize the assets and liabilities arising from leases on the balance sheet. ASU 2016-02 requires entities to use a modified retrospective approach for leases that exist or are entered into after the beginning of the earliest comparative period in the financial statements. ASU 2016-02 is effective for annual reporting periods beginning after December 15, 2018. Early adoption is permitted. The Company is evaluating the impact, if any, of adopting ASU 2016-02 on its financial statements.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

In April 2016, the FASB issued ASU No. 2016-10 (“ASU 2016-10”), *Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing*. This update clarifies how an entity identifies performance obligations related to customer contracts as well as helps to improve the operability and understanding of the licensing implementation guidance. The amendments in this update affect the guidance in ASU No. 2014-09, (“ASU 2014-09”), *Revenue from Contracts with Customers (Topic 606)*, which supersedes most of the current revenue recognition requirements. The underlying principle is that an entity will recognize revenue to depict the transfer of goods or services to customers at an amount that the entity expects to be entitled to in exchange for those goods or services. The guidance provides a five-step analysis of transactions to determine when and how revenue is recognized. Other major provisions include capitalization of certain contract costs, consideration of time value of money in the transaction price, and allowing estimates of variable consideration to be recognized before contingencies are resolved in certain circumstances. The guidance also requires enhanced disclosures regarding the nature, amount, timing and uncertainty of revenue and cash flows arising from an entity’s contracts with customers. The guidance is effective for the interim and annual periods beginning on or after December 15, 2017 (early adoption is not permitted). The guidance permits the use of either a retrospective or cumulative effect transition method. In May 2016, the FASB issued ASU No. 2016-12, (“ASU 2016-12”), *Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients*. This update clarifies the objectives of collectability, sales and other taxes, noncash consideration, contract modifications at transition, completed contracts at transition and technical correction. The amendments in this update affect the guidance in ASU 2014-09. In September 2017, the FASB issued additional amendments providing clarification and implementation guidance. The Company’s revenue is primarily generated from the sale of finished products to customers. Sales predominantly contain a single delivery element and revenue is recognized at a single point in time when ownership, risks, and rewards transfer. These are largely unaffected by the new standard as they closely align with the new standards principles relating to the measurement of revenue and timing of recognition. The Company will adopt Topic 606 effective January 1, 2018 using the full retrospective transition method. As the underlying principles of the new standard, relating to the measurement of revenue and the timing of recognition, are closely aligned with the Company’s current business model and practices, the adoption of ASU 2014-09 will not have a material impact on the consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15 (“ASU 2016-15”), *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* which adds or clarifies guidance on the classification of certain cash receipts and payments in the statement of cash flows. The standard addresses eight specific cash flow issues with the objective of reducing diversity in practice. ASU 2016-15 is effective for the interim and annual periods beginning after December 15, 2017 with early adoption permitted. The Company does not anticipate that the adoption of ASU 2016-15 will have a material impact on its consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18 (“ASU 2016-18”), *Statement of Cash Flows (Topic 230): Restricted Cash*. The standard requires that amounts generally described as restricted cash and restricted cash equivalents to be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amount shown on the statement of cash flows. In addition, the standard requires disclosure of the nature of restrictions on cash balances and how the statement of cash flows reconciles to the balance sheet in any situation in which the balance sheet includes more than one line item of cash, cash equivalents and restricted cash. ASU 2016-18 is effective for the interim and annual periods beginning after December 15, 2017 with early adoption permitted. The Company does not anticipate that the adoption of ASU 2016-18 will have a material impact on its consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-01 (“ASU 2017-01”), *Business Combinations (Topic 805): Clarifying the Definition of a Business*. This update clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposal) of assets or businesses. The update provides new guidance to determine when an integrated set of assets and activities (collectively referred to as a “set”) is not a business. The guidance requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not a business. ASU 2017-01 is effective for the interim and annual periods beginning after December 15, 2017 with early adoption permitted. The Company does not anticipate that the adoption of ASU 2017-01 will have a material impact on its consolidated financial statements.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****2. SEGMENT INFORMATION**

The Company has determined that it operates in only one segment as it only reports profit and loss information on an aggregate basis to its chief operating decision maker.

Revenue is attributed by geographic region based on ship-to location of the Company's customers. The following table summarizes revenue by geographic region:

| | Year Ended December 31, | |
|---------------|----------------------------|----------|
| | 2017 | 2016 |
| | (in thousands) | |
| United States | \$3,158 | \$3,364 |
| Canada | 899 | 876 |
| Israel | 715 | 398 |
| Turkey | 154 | 47 |
| Germany | 33 | 8,945 |
| Malaysia | — | 2,880 |
| Korea | — | 1,486 |
| Taiwan | 14 | 847 |
| Australia | — | 509 |
| China | 6 | 222 |
| Other | 65 | 56 |
| Total revenue | \$5,044 | \$19,630 |

The following table summarizes sales by product type:

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Year ended
December 31,
2017 2016
(in thousands)

| | | |
|------------------------|---------|----------|
| Optical | \$4,615 | \$4,568 |
| Wafer | 9 | 13,121 |
| Core | 26 | 1,652 |
| Research & development | 394 | 289 |
| Total revenue | \$5,044 | \$19,630 |

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

The following table summarizes assets by geographic region:

| | As of December 31, 2017 2016 (in thousands) | |
|---------------|---|----------|
| United States | \$30,037 | \$47,171 |
| Malaysia | 5,007 | 5,811 |
| Other | 4 | 31 |
| Total assets | \$35,048 | \$53,013 |

3. INVESTMENTS

When the Company invests available cash, it primarily invests it in investment grade commercial paper, corporate notes, FDIC guaranteed certificates of deposit, common stock and government securities. The Company's investments are classified as available-for-sale securities and are carried at fair value with unrealized gains and losses recorded in accumulated other comprehensive income (loss).

The following table presents the amortized cost, and gross unrealized gains and losses on all securities at December 31, 2017:

| | Amortized cost (in thousands) | Gross unrealized gains | Gross unrealized losses | Fair value |
|------------------------------|-------------------------------------|------------------------------|-------------------------------|---------------|
| Short-term investments: | | | | |
| Commercial paper | \$4,994 | \$ — | \$ 1 | \$4,993 |
| Corporate notes/bonds | 1,458 | — | — | 1,458 |
| Total short-term investments | \$6,452 | \$ — | \$ 1 | \$6,451 |

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Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

The Company did not have any short-term investments as of December 31, 2016.

The Company values its investments at fair value, defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The standard describes a fair value hierarchy based on three levels of inputs, of which the first two are considered observable and the last unobservable, that may be used to measure fair value which are the following:

Level 1—Quoted prices in active markets for identical assets or liabilities.

Level 2—Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The Company's fixed income available-for-sale securities consist of high-quality, investment grade commercial paper, FDIC guaranteed certificates of deposits, corporate notes and government securities. The Company values these securities based on pricing from pricing vendors, who may use quoted prices in active markets for identical assets (Level 1 inputs) or inputs other than quoted prices that are observable either directly or indirectly (Level 2 inputs) in determining fair value. The valuation techniques used to measure the fair value of the Company's financial instruments having Level 2 inputs were derived from non-binding market consensus prices that are corroborated by observable market data, quoted market prices for similar instruments, or pricing models, such as discounted cash flow techniques.

The following table summarizes the Company's financial assets measured at fair value on a recurring basis as of December 31, 2017:

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Level 1 Level 2 Level 3 Total
(in thousands)

Cash equivalents:

| | | | | |
|--------------------|---------|-----|------|---------|
| Money market funds | \$4,575 | \$— | \$ — | \$4,575 |
|--------------------|---------|-----|------|---------|

Investments:

Available-for-sales securities—current:

| | | | | |
|-----------------------|---------|---------|------|----------|
| Commercial paper | — | 4,993 | — | 4,993 |
| Corporate notes/bonds | — | 1,458 | — | 1,458 |
| Total | \$4,575 | \$6,451 | \$ — | \$11,026 |

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

The following table summarizes the Company's financial assets measured at fair value on a recurring basis as of December 31, 2016:

| | Level 1 | Level 2 | Level 3 | Total |
|---|----------------|---------|---------|----------|
| | (in thousands) | | | |
| Cash equivalents: | | | | |
| Money market funds | \$10,949 | \$ — | \$ — | \$10,949 |
| Investments: | | | | |
| Available-for-sales securities—current: | | | | |
| FDIC guaranteed certificates of deposit | — | — | — | — |
| Corporate notes/bonds | — | — | — | — |
| Total | \$10,949 | \$ — | \$ — | \$10,949 |

There are no terms or conditions restricting the Company from redeeming any of its investments.

In addition to the debt securities noted above, the Company had approximately \$6.9 million and \$6.7 million of time deposits included in cash and cash equivalents as of December 31, 2017 and 2016, respectively.

4. SIGNIFICANT CUSTOMERS

For the year ended December 31, 2017, the Company had two customers that accounted for approximately 18% and 13% of its revenue. For the year ended December 31, 2016, the Company had one customer that accounted for approximately 60% of its revenue.

Customers individually representing more than 10% of trade receivables accounted for approximately 69% and 75% of accounts receivable as of December 31, 2017 and 2016, respectively. The Company grants credit to customers based on an evaluation of their financial condition. Losses from credit sales are provided for in the financial

statements.

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Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

5. LONG-LIVED ASSET IMPAIRMENT CHARGES

When circumstances, such as adverse market conditions, indicate that the carrying value of a long-lived asset may be impaired, the Company performs an analysis to review the recoverability of the asset's carrying value. The Company makes estimates of the undiscounted cash flows (excluding interest charges) from the expected future operations of the asset. These estimates consider factors such as expected future operating income, operating trends and prospects, as well as the effects of demand, competition and other factors. If the analysis indicates that the carrying value is not recoverable from future cash flows, an impairment loss is recognized to the extent that the carrying value exceeds the estimated fair value. The estimated fair value of assets is determined using appraisal techniques which assume the highest and best use of the asset by market participants, considering the use of the asset that is physically possible, legally permissible, and financially feasible at the measurement date. Any impairment losses are recorded as operating expenses, which reduce net income.

In September 2016, as the Company believed the prospects of becoming profitable in the LED substrate market to be unlikely for the foreseeable future, the Company announced its decision to limit its focus to the optical and industrial sapphire markets and to exit the LED market. This resulted in closing of the Malaysia facility. In the fourth quarter of 2016, the Company developed a plan to scale down the remaining operations and sell additional assets that would not be needed for the Company's business plan. In this regard, the Company identified excess U.S. machinery, equipment and facilities. The Company engaged an independent valuation company to assist in the determination of the fair value of assets to provide an updated valuation of the U.S. and Malaysia machinery and equipment. The Company evaluated its U.S. asset portfolio for the assets continuing to be used in operations using a cost and market approach to determine the current fair value. The Company evaluated its Malaysia asset portfolio and excess U.S. assets based on assuming an orderly liquidation plan which considers economic obsolescence and sales of comparable equipment, as it is the Company's intention to sell these assets. Based on this review, the Company recorded for the year ended December 31, 2016 an asset impairment charge on U.S. and Malaysia machinery and equipment of \$12.3 million.

At September 30, 2017, the Company reviewed the current fair value of its assets. With the scaling down of the Company's U.S. operations, the Company identified at September 30, 2017, additional assets that will not be needed. The Company reduced the net book value of certain machinery and equipment and recorded an asset impairment charge of \$675,000. At December 31, 2017, the Company reviewed the current fair value of the U.S. and Malaysia machinery and equipment. An impairment charge of \$354,000 was recorded on lower expected sales prices for assets held for sale and identification of additional assets that will not be needed to support current operations.

The Company is actively pursuing the sale or lease of a 134,400 square foot manufacturing and office facility in Batavia, Illinois, a parcel of extra land the Company owns in Batavia, Illinois, and a 65,000 square foot facility in Penang, Malaysia. Since the expected sale price is below the book value of these properties, for the year ended December 31, 2016, an impairment charge of \$14.3 million was recorded. For the year ended December 31, 2017, the expected sale price for the Batavia, Illinois facility and parcel of extra land was further reduced resulting in recording an additional impairment charge of \$4.0 million.

The Company will continue to assess its long-lived assets to ensure the carrying amount of these assets is still appropriate given any changes in the asset usage, marketplace and other factors used in determining the current fair value.

The Company cannot guarantee that it will be able to successfully complete the sale or lease of any assets.

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

The table below summarizes the non-financial assets that were measured and recorded at fair value on a non-recurring basis as of December 31, 2017 and loss recorded during the twelve months ended December 31, 2017 on those assets:

| | Carrying value at December 2017 | Quoted prices in active markets for identical assets (Level 1) | Significant other observable inputs (Level 2) | Significant unobservable inputs (Level 3) | Loss for twelve months ended December 31, 2017 |
|---|---------------------------------|--|--|--|--|
| | | (in thousands) | | | |
| Long-lived assets held and used | \$815 | \$ — | \$ — | \$ 815 | \$ 1,028 |
| Long-lived assets held for sale | 11,202 | — | — | 11,202 | 4,023 |
| Total nonrecurring for value measurements | \$ 12,017 | \$ — | \$ — | \$ 12,017 | \$ 5,051 |

At December 31, 2017 long-lived assets have been reclassified from Level 2 assets to Level 3 assets as the determination of fair value for the year ended December 31, 2017 included inputs that are not readily observable or easily corroborated by observable market data.

The table below summarizes the non-financial assets that were measured and recorded at fair value on a non-recurring basis as of December 31, 2016 and loss recorded during the twelve months ended December 31, 2016 on those assets:

| Carrying value at December 31, 2016 | Quoted prices in active markets for identical assets (Level 1) | Significant other observable inputs (Level 2) | Significant unobservable inputs (Level 3) | Loss for twelve months ended December 31, 2016 |
|-------------------------------------|--|--|--|--|
|-------------------------------------|--|--|--|--|

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(in thousands)

| | | | | | | | |
|---|----------|----|---|-----------|----|---|-----------|
| Long lived assets held and used | \$7,110 | \$ | — | \$ 7,110 | \$ | — | \$ 12,264 |
| Long lived assets held for sale | 14,761 | | — | 14,761 | | — | 14,290 |
| Total nonrecurring for value measurements | \$21,871 | \$ | — | \$ 21,871 | \$ | — | \$ 26,554 |

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Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

6. STOCKHOLDERS' EQUITY

Common stock

On April 19, 2017, the Company received a staff determination letter from the Listing Qualifications Department of NASDAQ informing the Company that it has failed to regain compliance with the minimum bid price requirement set forth in Listing Rule 5550(a) (2), and that the Company's common stock would be delisted from the NASDAQ Capital Market at the opening of business on April 28, 2017 unless the Company timely requested an appeal of this determination. On April 26, 2017, the Company submitted an appeal requesting a hearing before a NASDAQ listing qualifications panel. With completion of the reverse stock split (described below) the Company's shares began trading above the required \$1.00 per share closing bid price. On May 19, 2017, the Company received notification from NASDAQ that the bid price deficiency had been cured and the Company is considered in compliance with all applicable listing standards.

At the Company's annual meeting of stockholders held on May 3, 2017, the Company's stockholders approved, (i) an amendment to the Company's Eighth Amended and Restated Certificate of Incorporation (as amended, the "Certificate of Incorporation") to effect a reverse stock split of the Company's common stock in a range of 1-for-10 to 1-for-20, such ratio to be determined in the sole discretion of the Board; and (ii) an amendment to the Certificate of Incorporation to decrease the Company's authorized number of shares of common stock to three times the number of shares of the Company's common stock outstanding immediately following the reverse stock split, rounded up to the nearest 100,000 shares. On May 3, 2017, following the annual meeting, the Board determined to effect the reverse stock split at a ratio of 1-for-10, and the Company filed with the Secretary of State of the State of Delaware a Certificate of Amendment to (a) implement the reverse stock split and (b) to reduce the number of authorized shares of common stock from 40,000,000 to 8,200,000, consequently reducing the number of total authorized shares from 45,000,000 to 13,200,000. The amendment, reverse stock split and reduction in authorized shares were effective on May 5, 2017.

As a result of the reverse stock split, every 10 shares of issued and outstanding common stock were automatically combined into one issued and outstanding share of common stock. Following the amendment to the Certificate of Incorporation, the Company has a total of 13,200,000 authorized shares, comprised of (i) 8,200,000 shares of common stock and (ii) 5,000,000 shares of preferred stock.

Stockholders received cash in lieu of any fractional shares resulting from the reverse stock split in a proportionate amount equal to \$0.78 per pre-split share based on the average closing price of the Common Stock for the 30 trading days immediately preceding the effective date of the reverse stock split.

The Company's consolidated financial statements, related notes and other financial data contained in this report have been adjusted to give the retroactive effect to the decreased authorization and reverse stock split for all periods presented.

Common shares reserved

As of December 31, 2017, the Company had reserved 147,948 shares of common stock for issuance upon the exercise of outstanding common stock options and vesting of restricted stock units. Also 274,494 shares of the Company's common stock were reserved for future grants of stock options and restricted stock units (or other similar equity instruments) under the Rubicon Technology, Inc. 2016 Stock Incentive Plan (the "2016 Plan") as of December 31, 2017.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****7. STOCK INCENTIVE PLANS**

In August 2007, the Company adopted the Rubicon Technology Inc. 2007 Stock Incentive Plan, which was amended and restated effective in March 2011 (the “2007 Plan”), and which allowed for the grant of incentive stock options, non-statutory stock options, stock appreciation rights, restricted stock, restricted stock units (“RSUs”), performance awards and bonus shares. The maximum number of shares that could be awarded under the 2007 Plan was 440,769 shares. Options granted under the 2007 Plan entitle the holder to purchase shares of the Company’s common stock at the specified option exercise price, which could not be less than the fair market value of the common stock on the grant date. On June 24, 2016, the plan terminated with the adoption of the Rubicon Technology, Inc. 2016 Stock Incentive Plan, (the “2016 Plan”). Any existing awards under the 2007 Plan remain outstanding in accordance with their current terms under the 2007 Plan.

In June 2016, the Company’s stockholders approved adoption of the 2016 Plan effective as of March 17, 2016, which allows for the grant of incentive stock options, non-statutory stock options, stock appreciation rights, restricted stock, RSUs, performance awards and bonus shares. The Compensation Committee of the Board administers the 2016 Plan. The committee determines the type of award to be granted, the fair market value, the number of shares covered by the award, and the time when the award vests and may be exercised.

Pursuant to the 2016 Plan, 222,980 shares of the Company’s common stock plus any shares subject to outstanding awards under the 2007 Plan that subsequently expire unexercised, are forfeited without the delivery of shares or are settled in cash, will be available for issuance under the 2016 Plan. The 2016 Plan will automatically terminate on March 17, 2026, unless the Company terminates it sooner.

The following table summarizes the activity of the stock incentive and equity plans:

| Shares available for grant | Number of options outstanding | Weighted-average option exercise price | Number of restricted stock shares issued | Number of restricted stock units outstanding |
|----------------------------|-------------------------------|--|--|--|
|----------------------------|-------------------------------|--|--|--|

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| | | | | | |
|----------------------------------|-----------|------------|----------|----------|-----------|
| Outstanding at January 1, 2016 | 73,227 | 285,157 | \$ 70.67 | 20,146 | 45,402 |
| Authorized | 190,000 | | | | |
| Granted | (153,769) | 94,362 | 6.34 | 59,407 | — |
| Exercised/issued | — | — | — | — | (13,368) |
| Canceled/forfeited | 133,760 | (125,978) | 89.63 | (3,070) | (19,450) |
| Outstanding at December 31, 2016 | 243,218 | 253,541 | 37.31 | 76,483 | 12,584 |
| Granted | (85,071) | — | — | 21,209 | 63,862 |
| Exercised/issued | — | (938) | 6.10 | — | (53,625) |
| Canceled/forfeited | 116,347 | (127,039) | 51.85 | — | (437) |
| Outstanding at December 31, 2017 | 274,494 | 125,564 | \$ 19.53 | 97,692 | 22,384 |

The following table sets forth option grants made during 2016 with intrinsic value calculated based on grant date fair value. No options were granted during 2017.

| Date of grant | Number of options granted | Exercise price | Intrinsic value per share |
|----------------------|---------------------------|------------------|---------------------------|
| January – April 2016 | 5,112 | \$7.30 - \$11.40 | — |
| September 2016 | 89,250 | \$6.10 | — |

There is no intrinsic value because the exercise price per share of each option was equal to the fair value of the common stock on the date of grant.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

At December 31, 2017, the exercise prices of outstanding options were as follows:

| Exercise price | Number of options outstanding | Average remaining contractual life (years) | Number of options exercisable |
|---------------------|-------------------------------|--|-------------------------------|
| \$6.10 - \$13.50 | 97,594 | 7.44 | 51,860 |
| \$40.10 - \$52.00 | 23,197 | 1.70 | 22,089 |
| \$77.50 - \$121.10 | 2,012 | 3.28 | 2,012 |
| \$194.90 - \$326.70 | 2,761 | 1.79 | 2,761 |
| | 125,564 | 4.31 | 78,722 |

The weighted average grant date fair value of the options that became vested in the years ended 2017 and 2016 was \$614,000 and \$928,000, respectively.

The following table summarizes the activity of non-vested options:

| | Non-vested options | Weighted-average option exercise price |
|---------------------------------|--------------------|--|
| Non-vested at January 1, 2016 | 125,196 | \$ 22.32 |
| Granted | 94,362 | 6.34 |
| Vested | (33,011) | 28.10 |
| Cancelled | (37,564) | 25.10 |
| Non-vested at December 31, 2016 | 148,983 | 10.20 |
| Vested | (47,618) | 12.89 |
| Cancelled | (54,523) | 9.50 |
| Non-vested at December 31, 2017 | 46,842 | \$ 8.26 |

The Company's aggregate intrinsic value is calculated as the difference between the exercise price of the underlying stock options and the fair value of the Company's common stock. Based on the fair value of the common stock at December 31, 2017 and 2016, there was no aggregate intrinsic value for options outstanding and exercisable.

For the year ended December 31, 2016, the Company used historical stock prices as the basis for its volatility assumptions. The assumed risk-free rates were based on U.S. Treasury rates in effect at the time of grant with a term consistent with the expected option lives. The expected term for the year ended December 31, 2016 is based upon the Company's median average life of its options. The forfeiture rate is based on past history of forfeited options. The expense is being allocated using the straight-line method. For the years ended December 31, 2017 and 2016, the Company recorded \$277,000 and \$527,000, respectively, of stock option compensation expense. As of December 31, 2017, the Company has \$177,000 of total unrecognized compensation cost related to non-vested options granted under the Company's stock-based plans that it expects to recognize over a weighted-average period of 1.92 years.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

For the year ended December 31, 2016, the assumptions used for the estimated fair value at the date of option grant using the Black-Scholes option-pricing model were as follows:

| | | |
|--|--------------|---|
| | 2016 | |
| Weighted average fair value per option | \$6.34 | |
| Expected term | 5.1 years | |
| Risk free interest rate | 1.24% -1.73% | |
| Volatility | 65 | % |
| Dividend yield | None | |
| Forfeiture rate | 23.1 | % |

The Company used a Monte Carlo simulation model valuation technique to determine the fair value of 59,098 RSUs granted in March 2017 to a key executive pursuant to an employment agreement because the awards vest based upon achievement of market price targets of the Company's common stock. The RSUs vest in the amounts set forth below on the first date the 15-trading day average closing price of the Company's common stock equals or exceeds the corresponding target price for the common stock before March 15, 2021.

| Number of restricted stock units | Target price |
|----------------------------------|--------------|
| 15,000 | \$ 6.50 |
| 15,000 | \$ 8.00 |
| 15,000 | \$ 9.50 |
| 14,098 | \$ 11.00 |

During the twelve months ended December 31, 2017, the first three tranches of the grant vested.

When the negotiation of the terms of the employment agreement began, the closing price of the common stock was approximately \$5.50 per share. On the date of grant, the closing price of the Company's common stock was \$6.30 per share.

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The Monte Carlo simulation model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the award and calculates the fair value of each RSU. The Company used the following assumptions in determining the fair value of the RSUs:

| | |
|---------------------------------------|-----------|
| Daily expected stock price volatility | 4.4237 % |
| Daily expected mean return on equity | (0.2226%) |
| Daily expected dividend yield | 0.0 % |
| Average daily risk free interest rate | 0.0063 % |

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

The daily expected stock price volatility is based on a four-year historical volatility of the Company's common stock. The daily-expected dividend yield is based on annual expected dividend payments. The average daily risk-free interest rate is based on the three-year treasury yield as of the grant date. Each of the tranches is calculated to have its own fair value and requisite service period. The fair value of each tranche is amortized over the requisite or derived service period, which is up to four years. These RSUs had a grant date fair value of \$322,623.

A summary of the Company's RSUs is as follows:

| | RSUs outstanding | Weighted average price at time of grant | Aggregate intrinsic value |
|---|-----------------------------|--|--------------------------------------|
| Non-vested restricted stock units as of January 1, 2016 | 45,402 | \$ 19.18 | |
| Vested | (13,368) | 16.01 | |
| Cancelled | (19,450) | 23.45 | |
| Non-vested restricted stock units as of December 31, 2016 | 12,584 | 16.00 | |
| Granted | 63,862 | 6.46 | |
| Vested | (53,625) | 9.41 | |
| Cancelled | (437) | 11.30 | |
| Non-vested at December 31, 2017 | 22,384 | \$ 4.65 | \$ 178,553 |

The fair value of each RSU is the market price on the date of grant and is being recorded as compensation expense ratably over the vesting terms. For the years ended December 31, 2017 and 2016, the Company recorded \$460,000 and \$262,000 of RSU expense, respectively. The RSUs are forfeited by a participant upon termination for any reason and there is no proportionate or partial vesting in the periods between the vesting dates. As of December 31, 2017, there was \$71,000 of unrecognized compensation cost related to the non-vested restricted stock units. This cost is expected to be recognized over a weighted-average period of 0.41 years.

An analysis of restricted stock issued is as follows:

| | |
|---|-------|
| Non-vested restricted stock as of January 1, 2016 | 1,520 |
|---|-------|

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| | |
|---------------------|----------|
| Granted | 59,407 |
| Vested | (41,387) |
| Cancelled/forfeited | (3,070) |

| | |
|---|----------|
| Non-vested restricted stock as of December 31, 2016 | 16,470 |
| Granted | 21,209 |
| Vested | (32,775) |

| | |
|---|-------|
| Non-vested restricted stock as of December 31, 2017 | 4,904 |
|---|-------|

For the years ended December 31, 2017 and 2016, the Company recorded \$160,000 and \$559,000, respectively, of stock compensation expense related to restricted stock.

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Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)****8. INCOME TAXES**

On December 22, 2017, the U.S. enacted the Tax Cuts and Jobs Act (the “Act”) which among other provisions reduced the U.S. corporate tax rate from 35% to 21% effective January 1, 2018. The SEC issued guidance on accounting for the tax effects of the Act. The guidance allows the Company to record provisional amounts for those impacts, with the requirement that the accounting be completed in a period not to exceed one year from the date of enactment. The Company has not completed its accounting for the tax effects of enactment of the Act; however the Company has made reasonable estimates of the effects on its existing deferred tax balances and the transition tax or deemed repatriation tax. As a result, the provision for income taxes and effective tax rate in 2017 included a non-cash charge of \$28.0 million due primarily to the remeasurement of deferred tax assets and liabilities expected to apply when the temporary differences are realized/settled at a rate of 21% versus 35%. As the Company is in a full valuation allowance position, an equal benefit adjustment was recorded. Also, the Company estimated a deemed inclusion in the amount of \$3.9 million related to the transition tax on untaxed earnings overseas which was applied against the 2017 net operating loss. Estimates will true up within the measurement period with the completion of filing of the federal and state tax returns.

Components of income before income taxes and the income tax provision are as follows:

(Loss) before income taxes

| | Year ended December 31, | |
|---------|-------------------------|--------------|
| | 2017 | 2016 |
| | (in thousands) | |
| U.S. | \$ (17,104) | \$ (50,689) |
| Foreign | (659) | (12,413) |
| Total | \$ (17,763) | \$ (63,102) |

Income taxes

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| | Year ended December 31, | |
|---|-------------------------|-----------|
| | 2017 | 2016 |
| | (in thousands) | |
| Current | | |
| U.S. | \$ — | \$ — |
| State | — | — |
| Foreign | 88 | 331 |
| Total current income tax expense | 88 | 331 |
| Deferred | | |
| U.S. | — | — |
| State | — | — |
| Foreign | — | (554) |
| Total deferred income tax expense (benefit) | — | (554) |
| Total income tax expense (benefit) | \$ 88 | \$ (223) |

The reconciliation of income tax computed at the federal statutory rate to income before taxes is as follows:

| | Year ended December 31, | |
|---|-------------------------|----------|
| | 2017 | 2016 |
| U.S. Federal statutory rate | (33.6)% | (34.0)% |
| State taxes net of federal benefit | (4.9) | (4.1) |
| Impact of new federal tax rate | 157.8 | — |
| Foreign rate differential and transactional tax | 0.3 | 1.8 |
| Impact of foreign tax holiday | — | (0.9) |
| Valuation allowance | (118.4) | 36.6 |
| Other | (0.7) | 0.2 |
| | 0.5 % | (0.4)% |

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

Deferred income taxes reflect the net tax effects of the temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes.

Significant components of the Company's net deferred income taxes are as follows at December 31:

| | 2017 | 2016 |
|-------------------------------------|----------------|----------|
| | (in thousands) | |
| Deferred tax assets: | | |
| Allowance for doubtful accounts | \$2 | \$12 |
| Inventory reserves | 3,672 | 3,855 |
| Accrued liabilities | 4 | 11 |
| Warrant interest expense | 196 | 269 |
| Stock compensation expense | 2,022 | 2,774 |
| State net operating loss—net of tax | 15,954 | 9,189 |
| Net operating loss carryforward | 37,856 | 50,284 |
| Tax credits | 999 | 825 |
| Depreciation | 5,117 | 4,995 |
| Valuation allowance | (65,817) | (72,199) |
| Total deferred tax assets | 5 | 15 |
| Deferred tax liability: | | |
| Prepaid expenses | (5) | (15) |
| Net deferred tax liability | \$— | \$— |

The Company adopted the guidance in ASU No. 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, which requires that all deferred tax assets and liabilities, along with any related valuation allowance, be classified as noncurrent in the balance sheet. As a result, each jurisdiction has one net noncurrent deferred tax asset or liability. The new guidance does not change the existing requirement that only permits offsetting within a jurisdiction. Companies are still prohibited from offsetting deferred tax liabilities from one jurisdiction against deferred tax assets of another jurisdiction. The change in accounting principle did not have an impact on the Company's results of operations, cash flows or stockholders' equity.

In March 2016, the FASB issued ASU No. 2016-09 (“ASU 2016-09”), *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* which modifies several aspects of the accounting for share-based payment transactions, including income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The Company adopted ASU 2016-09 at January 1, 2017, and the impact of adopting ASU 2016-09 for the twelve months ended December 31, 2017 was that the Company was required to bring the deferred tax assets related to off balance net operating losses onto the balance sheet. This increased the Company’s deferred tax assets by \$10.3 million with a corresponding entry to retained earnings. Since the Company continues to be in a full valuation allowance, there was an entry made to the valuation allowance to offset the increase to the deferred tax assets with a corresponding entry to retained earnings.

In accordance with ASC740 “Accounting for Income Taxes” (“ASC740”), the Company evaluates its deferred income tax assets quarterly to determine if valuation allowances are required or should be adjusted. ASC740 requires that companies assess whether valuation allowances should be established against their deferred tax assets based on consideration of all available evidence, both positive and negative, using a “more likely than not” standard. The Company is in a cumulative loss position for the past three years which is considered significant negative evidence that is difficult to overcome on a “more likely than not” standard through objectively verifiable data. Based on an evaluation in accordance with the accounting standards, as of December 31, 2017 and 2016, a valuation allowance of \$65.8 million and \$72.2 million, respectively has been recorded against the net U.S. and Malaysia deferred tax assets in order to measure only the portion of the deferred tax assets that are more likely than not to be realized based on the weight of all the available evidence. Until an appropriate level of profitability is attained, the Company expects to maintain a full valuation allowance on its U.S. and Malaysia net deferred tax assets. Any U.S. or Malaysia tax benefits or tax expense recorded on the Company’s Consolidated Statement of Operations will be offset with a corresponding valuation allowance until such time that the Company changes its determination related to the realization of deferred tax assets. In the event that the Company changes its determination as to the amount of deferred tax assets that can be realized, the Company will adjust its valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

Rubicon Technology, Inc.**Notes to Consolidated Financial Statements—(Continued)**

At December 31, 2017, the Company had separate Federal and Illinois net operating loss carryforwards (“NOL”) of \$177.9 million and \$212.0 million, respectively, which begin to expire in 2021 and 2019, respectively. With the adoption of ASU 2016-09 in 2017, the Company recorded a deferred tax asset related to \$26.4 million of unrecorded federal and state NOL’s attributable to stock option exercises. The impact of bringing these NOL’s onto the balance sheet was fully offset by the valuation allowance. The Company has also recorded an uncertain tax position of \$2.6 million that further reduces the net operating loss deferred tax assets reported in the financial statements. In addition, at December 31, 2017, the Company had Federal and Illinois research and development credits and Illinois investment tax credits of \$805,000, \$66,000 and \$95,000, respectively which begin to expire in 2018. Tax credits are accounted for using the flow through method and therefore are taken in the year earned.

The Company completed an analysis of the utilization of net operating losses subject to limits based upon certain ownership changes as of December 31, 2017. The results of this analysis indicated no ownership change limiting the utilization of net operating losses and tax credits.

The Company prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken, or expected to be taken, in a tax return. At December 31, 2017 and 2016, the Company had unrecognized tax benefits taken or expected to be taken in a tax return that have been recorded on the Company’s financial statements of \$1.1 million that are related to tax positions taken in 2012. It is not reasonably possible that the amount will change in the next twelve months.

A reconciliation of the beginning and ending balance of the unrecognized tax benefit follows (in thousands):

| | |
|--|---------|
| Balance at December 31, 2016 | \$1,141 |
| Decrease related to prior year positions | — |
| Tax position related to current year | — |
| Balance at December 31, 2017 | \$1,141 |

There were no interest or penalties related to income taxes that have been accrued or recognized as of and for the years ended December 31, 2017 and 2016.

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Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

The Company files income tax returns in the United States federal jurisdiction and in a state jurisdiction. During 2009, the Company began foreign operations in Malaysia and is subject to local income taxes in that jurisdiction. The Company is exempt from Malaysian income tax for a five-year period beginning in 2009 with a five year renewal. As the Company believes the prospects of becoming profitable in the LED substrate market to be unlikely for the foreseeable future, the Company ceased production activities in the Rubicon Sapphire Technology (Malaysia) SDN BHD (“Rubicon Malaysia”) facility effective November 30, 2016. The Company requested the Malaysian government to modify the tax holiday to allow it to extend through 2016 even though the Company did not meet the original requirements. Due to the uncertainty of the modification being granted, at December 31, 2016 the Company recorded a current income tax provision of \$42,000 of Malaysia income tax with the expectation that the holiday will not be granted. During 2017, the Company was granted approval for extension of the holiday and the \$42,000 was reversed. The Company’s Malaysia tax returns for the periods ended December 31, 2010 through 2012 have been audited by the Malaysia Inland Revenue Board with no changes made to the taxable income for those years. All other tax years in Malaysia are open to examination by tax authorities.

The Company’s federal tax returns for the periods ended December 31, 2010, 2008 and 2007 have been audited by the Internal Revenue Service (IRS) with no changes made to the Company’s taxable losses for those years. The Company’s state tax returns for the periods ended December 31, 2009 through 2012 have been audited by the Illinois Department of Revenue with no changes made to the Company’s taxable losses for those years. Due to the existence of net operating loss carryforwards, tax years ended December 31, 2001 through 2006, 2008, 2009 and 2011 through 2016 are open to examination by tax authorities for Federal purposes. Due to net operating loss carryforwards at the State level, tax years ended 2004 through 2006 and 2008 through 2016 are open to examination by state tax authorities.

Due to the closing of the Rubicon Malaysia operations, the Company no longer considers the undistributed earnings of Rubicon Malaysia to be indefinitely reinvested. Upon liquidation of Rubicon Malaysia, it is anticipated any cash left after the liquidation will be brought back to the U.S. via a payment of principal towards the intercompany loan. A withholding tax will be payable to the Malaysian government on the interest portion of the loan. At December 31, 2017 and 2016, the Company accrued the withholding tax on the interest balance of the loan in the amount of \$129,000 and \$274,000, respectively, which represents the incremental tax.

9. CREDIT FACILITY

On January 2, 2013, the Company entered into a three-year term agreement with a bank to provide the Company with a senior secured credit facility of up to \$25.0 million. The agreement provided for the Company to borrow up to 80% of eligible accounts receivable and up to 35% of domestically held raw material and finished goods inventory. Advances against inventory were limited to 40% of the aggregate outstanding on the revolving line of credit and \$10.0 million in aggregate. The Company had the option to borrow at an interest rate of LIBOR plus 2.75% or the Wall Street Journal prime rate plus 0.50%. If the Company maintained liquidity of \$20.0 million or greater with the lending institution, then the borrowing interest rate options were LIBOR plus 2.25% or the Wall Street Journal prime rate. There was an unused revolving line facility fee of 0.375% per annum. The facility was secured by a first priority interest in substantially all of the Company's personal property, excluding intellectual property. The Company was required to maintain an adjusted quick ratio of 1.40 to 1.00, maintain operating and other deposit accounts with the bank or bank's affiliates of 25% of the Company's total worldwide cash, securities and investments, and the Company could pay dividends or repurchase capital stock only with the bank's consent during the three-year term. In August 2015, the Company entered into an amended agreement with the bank to extend the senior secured facility through January 2, 2018. Under the amended agreement, advances against inventory were limited to the lesser of 45% of the aggregate outstanding principal on the revolving line of credit and \$10.0 million and the rate on the facility fee on the unused portion of the revolving line was adjusted to 0.50% per annum. All other terms and conditions remained the same. The agreement contained a subjective acceleration clause and required the Company to maintain a lockbox. As a result, the Company classified the debt as a current liability on its balance sheet.

On September 9, 2016, the Company voluntarily terminated the loan agreement. Pursuant to the pay-off letter for termination of the loan agreement, upon payment of the pay-off amount, all obligations under the loan agreement were paid and discharged in full, all unfunded commitments by the bank to make credit extensions to the Company under the loan agreement were terminated, all security interests granted to or held by the bank under the loan agreement were released, and all guaranties supporting the loan agreement were released. The Company did not incur any early termination penalties in connection with the termination.

For the year ended December 31, 2016, the Company recorded interest expense of \$99,000 related to the credit facility which includes \$92,000 of interest expense charged on the unused portion of the facility.

Rubicon Technology, Inc.

Notes to Consolidated Financial Statements—(Continued)

10. COMMITMENTS AND CONTINGENCIES

Operating Leases

The Company leases buildings used for manufacturing and offices. The leases provide for payment of the Company's proportionate share of operating expenses and real estate taxes.

Net rent expense under operating leases in 2017 and 2016 amounted to \$592,500 and \$589,900, respectively.

Future minimum payments under all leases are as follows:

| Year ending December 31, | Operating leases (in thousands) |
|------------------------------|--|
| 2018 | \$ 468 |
| 2019 | 145 |
| Balance at December 31, 2017 | \$ 613 |

Litigation

From time to time, the Company experiences routine litigation in the normal course of its business. The management of the Company does not believe any pending litigation, will have a material adverse effect on the financial condition or results of operations of the Company.

11. BENEFIT PLAN

The Company sponsors a 401(k) savings plan (the “Plan”). Employees are eligible to participate in the Plan upon reaching 18 years of age. Employees make contributions to the Plan through payroll deferrals and employer matching contributions are discretionary. There were no employer matching contributions for the years ended December 31, 2017 and 2016.

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