

Rubicon Technology, Inc.
Form 10-K
March 16, 2017
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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, 2016**

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
Incorporation or Organization)

36-4419301
(I.R.S. Employer
Identification No.)

900 East Green Street

Bensenville, Illinois
(Address of Principal Executive Offices)

60106
(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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate 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, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

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, 2016, there were 24,064,398 shares of common stock outstanding held by nonaffiliates of the registrant, with an aggregate market value of the common stock (based upon the closing price of these shares on the NASDAQ Global Market) of approximately \$16,363,791.

The number of shares of the registrant's common stock outstanding as of the close of business on March 9, 2017 was 26,878,891.

Documents incorporated by reference:

Portions of the Registrant's Proxy Statement for its 2017 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 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.

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. or our consolidated subsidiaries.

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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. The LED and mobile device markets for sapphire have attracted significant investment in sapphire production in China, which has resulted in oversupply and low pricing. We had been trying to stay in the LED substrate market by limiting our product offering to six-inch diameter wafers and working hard to reduce cost to make this product profitable. While we made significant progress on that front, the continual decline of prices made the prospects of becoming profitable in the LED substrate market unlikely for the foreseeable future. As a result, in September 2016, we announced our decision to limit our focus to the optical and industrial sapphire markets and exit the LED and mobile device markets. While these are smaller markets, we believe that due to more challenging customer requirements, competition is more limited and margin opportunities are greater. We believe our high quality crystal, strong and developing U.S. customer base, and optical finishing capability are strong differentiators from our competitors in the optical and industrial sapphire markets, and we believe there may be emerging applications in these markets.

With the decision to exit the LED market, we transitioned our patterning equipment to a strategic customer and subsequently closed our plant in Penang, Malaysia and are attempting to sell the real estate and equipment located there. We stopped production activities in November 2016 and ceased all operations in Penang, Malaysia in December 2016. Our wafer patterning equipment in Penang, Malaysia was sold in the fourth quarter of 2016 for \$4.5 million, and we have structured and begun an auction process to attempt to sell the polishing and fabrication equipment. Additionally, our Malaysia real estate is currently on the market. The timing of the sale of the real estate is difficult to predict.

Focusing on smaller optical and industrial sapphire markets also means that we now have excess crystal growth and fabrication capacity in the U.S. We are in the process of consolidating operations into our leased spaces in Bensenville, Illinois and Franklin Park, Illinois and vacating our largest owned facility in Batavia, Illinois. The relocation is now near completion and we are planning a second auction for the excess equipment in the Batavia plant in the next 60 days. 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 selling this property and our initial focus is to seek a buyer that is interested in both the building and improved infrastructure. Timing on the sale of this real estate is also difficult to predict.

With the shutdown of our Malaysia operations and downsizing of our U.S. operations, we have reduced overall company headcount from 220 at September 30, 2016 to 40 at February 28, 2017. However, we have been careful to maintain the employee knowledge base in our strategic markets built over the past 15 years.

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, in future periods we expect our LED revenue will cease. We anticipate that our sales will be almost exclusively 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
2016	\$ 4,568	23%
2015	\$ 5,086	21%
2014	\$ 7,057	15%

We operate in an extremely volatile market, so our ability to expand our optical and industrial business and 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 both in and outside of the sapphire market in order to accelerate growth and to utilize our substantial net tax loss carry-forwards. Because acquisitions are being given greater consideration, in February 2017, we commenced a search for a new Chief Executive Officer (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 a director of the Company.

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We are a Delaware corporation incorporated on February 7, 2001. Our common stock is listed on the NASDAQ Capital Market under the 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. These markets are 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.

We have automated the crystal growth process of our proprietary ES2 technique. Our furnace environments are controlled by closed-loop control systems and the overall crystal growth process is run with minimal operator intervention, which reduces the potential for human error. In addition, 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 now completed the window blank deliverables on this project, including the largest size sapphire window available in the world at 36 x 18 x 1 inch dimensions. While the project will not be fully completed until our subcontractors complete the polishing of the windows, we have received permission from the government to begin selling and commercializing LANCE sapphire products. 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.

We also continue development of our family of aluminum oxide-based, clear optical coatings for glass and quartz parts that provide most of the durability of sapphire at a lower cost. We have branded the coatings SapphirEX. We have provided samples of coated glass and quartz to a number of prospective customers for products in the retail scanner, semiconductor processing, defense and consumer electronics markets. We continue to work on active

qualification for use in the point of sale (POS) scanner market with some of our samples being tested in stores. We feel that initially we are more likely to find a number of niche markets, such as POS scanners, but also believe there is potential to address larger markets, such as smart phones and tablets and we are providing samples for smart-phone after-market cover glass as well as the OEM market for ruggedized mobile applications. We are focusing on building contract manufacturing relationships that we can rely on for production volumes in order to avoid major capital expenditures.

PRODUCTS

We believe the developing optical and industrial segments of the market require large diameter sapphire products, high quality sapphire and ultra-thin double side polished windows and wafers which many sapphire producers do not have the capability to provide. In addition, military 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 also have the ability to maintain that crystal quality while growing crystal in very large formats, we have a strong and developing U.S. customer base, and we have the ability to provide very high performance ultra-thin double side polished sapphire products, which we believe position us well in these markets.

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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 windows, 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 18" x 36" x 1" dimensions.

RESEARCH AND DEVELOPMENT

Our research and development (R&D) activity plays a vital role in supporting our technology, product and revenue roadmaps. In 2016 and 2015, our R&D expenses totaled \$2.5 million and \$2.2 million, respectively. However, the scope of R&D projects has recently been reduced, and we expect R&D expenses to be significantly lower in 2017. These expenses generally do not include costs incurred in connection with our R&D activities under the LANCE government contract. However, in 2016 we recorded estimated costs of \$217,000 in excess of the contract value at December 31, 2016.

Activities under the LANCE government contract 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, 2016 and 2015 revenue from R&D accounted for less than 10% of our revenue. Since 2012, we have recorded \$4.3 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 as a percentage of total revenue to be significantly lower in 2017, despite overall revenue being lower due to our exit from the LED market.

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 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.

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CUSTOMERS

Our principal customers have been semiconductor device manufacturers and wafer polishing companies. A substantial portion of our sales have been to a small number of customers. In 2016 our top customer accounted for approximately 60% of our revenue and in 2015, the top two customers accounted for a combined approximately 31% of our revenue. Our revenue from the optical and industrial markets also tends to be concentrated, with three customers accounting for approximately 19%, 13%, and 11% of the optical revenue for the year ended December 31, 2016 and four customers accounting for approximately 20%, 14%, 10% and 10% of the optical revenue for the year ended December 31, 2015. 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 2016 or 2015.

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 seven patents issued by the U.S. Patent and Trademark office expiring between 2027 and 2030. In addition, we have twelve pending patent applications with the U.S. Patent and Trademark Office and twenty patent applications pending 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;

providing a low total cost-of-ownership for customers;

driving innovation through focused research and development efforts;

offering solutions through collaborative efforts with customers;

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 segments of the market 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 many other sapphire producers do 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.

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EMPLOYEES

As of December 31, 2016, we had 52 full-time employees and one part-time employee, of which 34 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.

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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. As of December 31, 2016, we had an accumulated deficit of \$312.3 million. While we had net income of \$38.1 million in 2011 and \$29.1 million in 2010, we incurred net losses of \$62.9 million, \$77.8 million, \$44.0 million, \$30.4 million and \$5.5 million in 2016, 2015, 2014, 2013 and 2012, respectively. There can be no assurance that we will have sufficient revenue growth 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 or business segments, 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. In the fourth quarter 2016, we developed a plan to scale down our U.S. operations. We evaluated our U.S. asset portfolio for the assets continuing to be used in operations and determined there were excess U.S. assets that we intend to sell. 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. There is no assurance that we will be able to sell our assets in Malaysia or the U.S. at prices favorable to us, or at all. 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, the interest of third parties in our business and the availability of financing to us or potential buyers 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 and may be forced to delay, reduce or eliminate our product research and development programs or delay the introduction of new products or the acquisition of other businesses.

We may require additional capital to fund operations, capital expenditures, additional product research and development efforts, and the introduction of new products or 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

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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 product research and development programs or 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 and growth rate 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 number and characteristics of new products that we pursue;

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.

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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.

We rely on a limited number of outsource providers and suppliers for raw materials and key components.

From time to time, we depend on a small number of suppliers for certain raw materials, components, services and equipment used in manufacturing our products. We generally purchase these items with purchase orders, and we have no guaranteed supply arrangements with such suppliers. We also outsource some of our production processes. We are subject to variations in the cost of these goods and services from period to period. We do not control the time and resources that these suppliers or service providers devote to our business, and we cannot be sure that these suppliers or service providers will perform their obligations to us or do so on a timely basis. In addition, some of these third parties are located in regions of the world that may experience periods of political or economic instability, which could inhibit their ability to supply necessary materials or services to us.

Any significant delay in product delivery or production processes, or other interruption or variation in supply or services from our key suppliers and providers could prevent us from meeting demand for our products and from obtaining future business. If we were to lose key suppliers or service providers or if they were unable to support our demand, our manufacturing operations could be interrupted and we could be required to attempt to establish supply arrangements with other suppliers or service providers. In addition, the inability of our suppliers to support our demand could be indicative of a market wide scarcity of materials, which could result in even longer or deeper interruptions. Any such delay or interruption would impair our ability to meet our customers' needs and, therefore, could damage our customer relationships and have a material adverse effect on our business and operating results.

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. Our annual revenue from optical and industrial products over the past three years has been between \$4.5 million and \$7.1 million, representing 15% to 23% of our total revenue in those years.

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

the amount and timing of costs relating to the expansion of our operations in the optical and industrial markets;

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;

market acceptance of our optical and industrial sapphire products and our customers' 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;

fluctuations in gross margins as a result of changes in capacity utilization, raw material costs, product mix or other factors;

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

the need to pay higher labor costs;

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

announcements of technological innovations, new products or upgrades to existing products by us or our competitors;

additions or departures of key personnel, which could be affected by our recent announcements to shift our business focus and consolidate our operations;

general economic conditions in the optical and industrial sapphire markets;

developments in trade secrets, patent or other proprietary rights by us or our competitors;

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

rapid changes in market conditions that result in financial hardship for some or all of our customers, resulting in reduced orders and/or accounts receivable write-offs in the future;

potential seasonal fluctuations in our customers' business activities; 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 2016 our top customer accounted for approximately 60% of our revenue and in 2015 our top two customers accounted for approximately 31% of our revenue. Our revenue from the optical and industrial markets also tends to be concentrated, with three customers accounting for approximately 19%, 13%, and 11% of the optical revenue for the year ended December 31, 2016 and four customers accounting for approximately 20%, 14%, 10% and 10% of the optical revenue for the year ended December 31, 2015. 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.

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

In 2016 and 2015, revenue from international sales for our optical and industrial markets products was approximately 35% and 28%, 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.

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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.

Our contracts for electricity require us to purchase certain minimum amounts in order to retain the pricing under the contract. If the amount we use is less than the required minimum, the difference is resold at the then prevailing market price and, if the resale price is lower than our contract price, we will experience a loss on that resale, which could adversely affect our gross margins and operating results.

Our manufacturing processes may be interrupted or our production may be delayed if we or our outsource providers cannot maintain sufficient electrical supply, which could adversely affect our business, financial condition and operating results.

Our manufacturing process requires a stable source of electricity. From time to time, we have experienced limited disruptions in our supply of electricity. Such disruptions, depending upon their duration, could result in a significant drop in throughput and yield of in-process crystal boules and create delays in our production. Although we use generators and other back-up sources of electricity, these replacement sources of electricity are only capable of providing effective back-up for limited periods of time. We cannot assure you that we will be successful in avoiding future disruptions in power or in mitigating the effects of such disruptions. Any material disruption in electrical supply could delay our production and could adversely affect our business, financial condition and operating results.

In addition, we outsource some of the finishing steps for our products and any interruption in the operations of third parties to whom we outsource could adversely impact our ability to deliver certain products. Such an interruption could adversely affect our business, financial condition and operating results.

Our proprietary intellectual property rights may not adequately protect our products and technologies, and the failure to protect such rights could harm our competitive position and adversely affect our operating results.

To protect our technology, we have chosen to rely primarily on trade secrets and to a lesser extent publicly filed patents. Trade secrets are inherently difficult to protect. While we believe we use reasonable efforts to protect our trade secrets, our directors, employees, consultants or contractors may unintentionally or willfully disclose our information to competitors, whether during or after the termination of their services to our Company. If we were to seek to enforce a claim that a third party had illegally obtained and was using our trade secrets, it would be expensive and time consuming, and the outcome would be unpredictable.

In addition, courts outside the U.S. are sometimes less willing to protect trade secrets than U.S. courts. Moreover, if our competitors independently develop equivalent knowledge, methods and know-how, it will be more difficult for us to protect our intellectual property and our business could be harmed.

We have seven issued patents covering our products and technologies and twenty-two patent applications pending. There can be no assurance that our pending patents will be issued or that any patents issued will be of significant value to our business. Our commercial success will depend on obtaining and maintaining trade secret, patent and other intellectual property protection of our products and technologies. We will only be able to protect products and

technologies from unauthorized use by third parties to the extent that valid, protectable and enforceable trade secrets, patents or other intellectual property rights cover them.

If we are not able to defend the trade secret or patent protection positions of our products and technologies, then we may not be able to successfully compete with competitors developing or marketing competing products and we may not generate enough revenue from product sales to justify the cost of development of our products and to achieve or maintain profitability.

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;

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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 may be subject to confidential information theft or misuse, which could harm our business and results of operations.

We face attempts by others to gain unauthorized access to our information technology systems on which we maintain proprietary and other confidential information. Our security measures may be breached as the result of industrial or other espionage actions of outside parties, employee error, malfeasance or otherwise, and as a result, an unauthorized party may obtain access to our systems. Additionally, outside parties may attempt to access our confidential information through other means, for example by fraudulently inducing our employees to disclose confidential information. We actively seek to prevent, detect and investigate any unauthorized access, which sometimes occurs. We might be unaware of any such access or unable to determine its magnitude and effects. The theft and/or unauthorized use or publication of our trade secrets and other confidential business information as a result of such an incident could adversely affect our competitive position and the value of our investment in research and development could be reduced. Our business could be subject to significant disruption and we could suffer monetary or other losses.

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.

Potential changes in trade relations or fiscal and tax policies implemented by the new presidential administration could have a material adverse effect on our business and results of operations.

Revenue from international sales constitutes a material portion of our total revenue and we anticipate it will continue to for the foreseeable future. The recent presidential election has created uncertainty with respect to trade relations between the United States and many of its trade partners. The current administration has suggested that it is not supportive of certain existing international trade agreements. At this time, it remains unclear what actions may be taken with respect to these international trade agreements. If the United States takes action to withdraw from or materially modify certain international trade agreements, our business, financial condition and results of operations could be adversely affected. Additionally, if tariffs or other restrictions are imposed on products imported from countries in which we make sales, or relations with such countries otherwise deteriorate, such countries could retaliate

by imposing similar tariffs or restrictions on products imported into those countries and it could cause negative sentiments toward the United States by our customers in those countries, either of which could result in the loss of customers and revenue from international sales. If our revenues generated from international sales decline significantly, it could have a material adverse effect on our business and results of operations.

The new administration has also called for substantial change to fiscal and tax policies, which may include comprehensive tax reform. We cannot predict the impact, if any, of these changes on our business. However, it is possible that these changes could adversely affect our business. Until we know what changes are enacted, we will not know whether in total we benefit from, or are negatively affected by, the changes.

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.

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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.

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). 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. We may 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. Accordingly, any such occurrences could adversely affect our financial condition, operating results and cash flows.

Global economic conditions could negatively impact on our business, financial condition and results of operations.

The global financial crisis that began in late 2007 caused extreme disruption in the financial markets. Although the disruption in the financial markets moderated thereafter, the global financial markets continue to reflect uncertainty about a sustained economic recovery. Uncertainty about global economic conditions could result in slow economic activity, concerns about inflation and energy costs, decreased business and consumer confidence, reduced capital spending and adverse business conditions, as well as diminished liquidity and credit availability in many financial markets. In addition, these economic and business conditions could cause reduced spending in our target markets and make it difficult for our customers and us to accurately forecast and plan future business activities. Continued weak economic conditions and further adverse trends in general economic conditions, consumer confidence, employment levels, business conditions, interest rates, availability of credit, inflation and taxation have in the past and may again in the future cause consumer spending to decline further, reduce demand for and prices of our products and our customers products, affect the prices and availability of raw materials, and limit our ability to obtain financing for our operations. Furthermore, our customers may be unable to access capital efficiently, or at all, which could adversely affect our financial condition by resulting in product delays, increased defaults in accounts receivables and increased inventory exposures. Any unfavorable economic or market conditions could have a material adverse effect on our business, financial condition and results of operations.

RISKS RELATED TO OWNERSHIP OF OUR COMMON STOCK

Our common stock could be delisted from NASDAQ if the closing bid price remains below \$1.00 per share.

On April 19, 2016, when our common stock was listed on the NASDAQ Global Market, we received notice from the Listing Qualifications Department of The NASDAQ Stock Market LLC (NASDAQ) indicating that we no longer complied with the minimum bid price requirement because the closing bid price for our stock had been below \$1.00 for 30 consecutive business days. In accordance with the NASDAQ listing rules, we had an initial grace period of 180 calendar days to regain compliance with the minimum bid price requirement. On October 18, 2016, we received approval from NASDAQ to transfer the listing of our common stock from the NASDAQ Global Market to the NASDAQ Capital Market. This transfer was effective at the opening of business on October 20, 2016. As a result of this transfer, we were granted an additional 180-day grace period to regain compliance with NASDAQ s minimum bid price requirement. To regain compliance and qualify for continued listing on the NASDAQ Capital Market, the bid price per share of our common stock must be at least \$1.00 for at least ten consecutive business days during the additional 180-day grace period, which will end on April 17, 2017. NASDAQ may, in its discretion, require our common stock to maintain a bid price per share of at least \$1.00 for a period in excess of ten consecutive business days, but generally no more than 20 consecutive business days, before determining that we have demonstrated an

ability to maintain long-term compliance. If we fail to regain compliance by April 17, 2017, we expect that NASDAQ will provide written notification to us that our common stock will be delisted. At that time, we may appeal the delisting determination to a NASDAQ Hearings Panel and our common stock would remain listed pending the panel's decision. There can be no assurance that, if we appeal the delisting determination, such appeal would be successful. There is no assurance that our common stock will not be delisted. If our common stock is delisted, additional sales practice requirements would be imposed on broker-dealers who sell our securities. The additional burdens imposed upon broker-dealers by these requirements could discourage broker-dealers from effecting transactions in our common stock. This would significantly affect the ability of investors to trade our securities and would significantly negatively affect the value and liquidity of our common stock. These factors could contribute to lower prices and larger spreads in the bid and ask prices for our common stock. In addition, if our common stock is delisted, it could make it significantly more difficult for us to raise capital and adversely affect the market liquidity for the offered securities. In connection with the transfer of our common stock to the NASDAQ Capital Market, we provided written notice to NASDAQ of our intention to cure the minimum bid price deficiency during the additional grace period, including by carrying out a reverse stock split, if necessary. If we seek to implement a reverse stock split in order to remain listed on

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NASDAQ, the announcement and/or implementation of a reverse stock split could significantly negatively affect the price of our common stock. Failure of our stockholders to approve a proposed reverse stock split, or any delay in receiving stockholder approval of a proposed reverse stock split, may hinder our ability to regain compliance with the minimum bid price requirement.

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.

From our initial public offering through March 9, 2017, the trading price of our common stock has ranged from a low of \$0.46 to a high of \$35.90.

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:

establishment of a classified Board of Directors;

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;

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.

Table of Contents**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 three buildings, which includes 30,000 square feet in our Bensenville, 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 these facilities terminate in July 2018 and June 2019.

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

Year ending December 31,	Lease Payments (in thousands)
2017	\$ 577
2018	457
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. The Batavia, Illinois and Penang, Malaysia land and facilities are currently available for sale.

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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.

Table of Contents**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, 2016		
First Quarter	\$ 1.78	\$ 0.72
Second Quarter	\$ 0.81	\$ 0.51
Third Quarter	\$ 0.79	\$ 0.56
Fourth Quarter	\$ 0.67	\$ 0.46
Fiscal year ended December 31, 2015		
First Quarter	\$ 4.90	\$ 3.80
Second Quarter	\$ 4.11	\$ 2.33
Third Quarter	\$ 2.44	\$ 1.00
Fourth Quarter	\$ 1.34	\$ 0.83

 Holders

As of March 9, 2017, our common stock was held by approximately 26 stockholders of record and there were 26,878,891 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.

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Recent Sales of Unregistered Securities

None.

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximately Dollar Value) of Shares that May Yet be Purchased Under the Plans or Programs
10/01/16 - 10/31/16	33,476 ⁽¹⁾	\$ 0.6301		
11/01/16 - 11/30/16				
12/01/16 - 12/31/16				
Total	33,476	\$ 0.6301		

(1) Our Board of Directors approved an arrangement to pay to one of our directors in cash one-half of the fees payable to him for director services in the fourth quarter of 2016; this resulted in the disposition to the Company of 33,476 shares of restricted stock previously granted to such director in exchange for an aggregate cash payment of \$21,093, which represented the then-current fair market value of such shares.

ITEM 6. SELECTED FINANCIAL DATA

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

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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 apply our proprietary crystal growth technology to produce high-quality sapphire products to meet our customers exacting specifications. 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. While these are smaller markets, we believe that due to more challenging customer requirements, competition is more limited and margin opportunities are greater. We believe the developing optical and industrial segments of the market require large diameter sapphire products, high quality sapphire and ultra-thin double side polished windows and wafers which many sapphire producers do not have the capability to provide. In addition, military 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 also have the ability to maintain that crystal quality while growing crystal in very large formats, we have a strong and developing U.S. customer base, and we have the ability to provide very high performance ultra-thin double side polished sapphire products, which we believe position us well in these markets. We provide optical and industrial sapphire products in various shapes and sizes, including round and rectangular windows and blanks, domes, tubes and rods.

We believe our high quality crystal, strong and developing U.S. customer base, and optical finishing capability are strong differentiators in the optical and industrial sapphire markets, and we believe there may be emerging applications in these markets. With the decision to exit the LED market, we stopped production activities in November 2016 and subsequently closed our plant in Penang, Malaysia in December 2016. Our wafer patterning equipment in Malaysia was sold in the fourth quarter of 2016 for \$4.5 million, and we have structured and begun an auction to attempt to sell the polishing and fabrication equipment. Additionally, the Malaysia real estate is currently on the market. The timing of the sale of the real estate is difficult to predict. With the decision to focus on smaller optical and industrial sapphire markets in the fourth quarter 2016, we evaluated our U.S. asset portfolio and determined that we now have excess crystal growth and fabrication capacity in the U.S. We plan to use crystal in inventory in the near-term and have outsourced certain finishing steps to third parties to reduce product costs and improve cash flow. We are in the process of consolidating operations into our leased space in Bensenville, Illinois and Franklin Park, Illinois and vacating our largest owned manufacturing and office facility in Batavia, Illinois. The relocation is now near completion and we are planning a second auction to attempt to sell the excess equipment in the Batavia plant in the next 60 days. 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 selling this property and our initial focus is to seek a buyer that is interested in both the building and improved infrastructure. Timing on the sale of this real estate is also 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., we expect in future periods our LED revenue will cease. We anticipate that our sales will be almost exclusively 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
2016	\$ 4,568	23%
2015	\$ 5,086	21%
2014	\$ 7,057	15%

We operate in an extremely volatile market, so our ability to expand our optical and industrial business and 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 both in and outside of the sapphire market in order to accelerate growth and to utilize our substantial net tax 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 a director of the Company.

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Our principal customers have historically been semiconductor device manufacturers and wafer polishing companies. A substantial portion of our sales have been to a small number of customers. In 2016, our top customer accounted for approximately 60% of our revenue and in 2015, our top two customers accounted for a combined approximately 31% of our revenue. Our revenue from the optical and industrial markets also tends to be concentrated, with three customers accounting for approximately 19%, 13%, and 11% of the optical revenue for the year ended December 31, 2016 and four customers accounting for approximately 20%, 14%, 10% and 10% of the optical revenue for the year ended December 31, 2015. 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 2016 or 2015.

We sell our products on a global basis and have derived a significant portion of our revenue from customers outside of the U.S. In most periods, the majority of our sales were to the European and Asian markets. We expect a major source of our future revenue to be from the North American market. The European, Asian, North American and Australian markets accounted for 48%, 28%, 21% and 3%, respectively, of our revenue for the year ended December 31, 2016, and 54%, 23%, 19% and 4%, respectively, of our revenue for the year ended December 31, 2015. 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 .

We currently depend on a small number of suppliers for certain components, services and equipment, including certain furnace components. We also outsource some of our production processes. If the supply of these components or outsourcing processes were to be disrupted or terminated, or if these suppliers were unable to supply the quantities of raw materials required, we may have difficulty in finding, or may be unable to find, alternative sources for these items. As a result, we may be unable to meet the demand for our products, which could have a material adverse impact on our business.

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.

We manufacture and ship our products from our facilities in the Chicago metropolitan area. We have approximately 226,400 square feet of manufacturing and office space in Batavia, Franklin Park and Bensenville, Illinois and a 65,000 square foot facility in Penang, Malaysia. The Malaysia and Batavia facilities are currently held for sale. Also, additional land in Batavia, Illinois we acquired in March 2012, is held for sale.

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. We recognize research and development revenue in the period during which the related costs are incurred. 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. Our R&D revenue in recent years has been related to our LANCE large rectangular window development which is largely complete. As a result, we expect our R&D revenue as a percentage of total revenue to be lower in 2017, despite overall revenue being lower due to our exit from the LED market. 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.

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, freight and warranties. We manufacture our products at our Illinois manufacturing facilities based on customer orders. We purchase materials and supplies to support such current and future demand. We are subject to variations in the cost of raw materials and consumables from period to period because we do not have long-term fixed-price agreements with most of our suppliers. When growing crystals, we use a considerable amount of electricity. 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. We determine our normal operating capacity and, if necessary, record as idle plant expense the costs attributable to lower utilization of equipment and staff.

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.

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

Sales and marketing expenses. Sales and marketing expenses consist primarily of salaries 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, 2016, 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, 2016 and 2015, 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 administrative personnel and is accounted for as a G&A expense. For the years ended December 31, 2016 and 2015, our stock-based compensation expense was \$1.4 million and \$1.3 million, respectively.

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

	Year ended December 31,	
	2016	2015
	(in millions)	
Revenue	\$ 19.6	\$ 23.8
Cost of goods sold	45.6	46.9
Gross loss	(26.0)	(23.1)
Operating expenses:		
General and administrative	7.7	9.6
Sales and marketing	1.4	1.4
Research and development	2.5	2.2
Long-lived asset impairment charge	26.6	39.6
Gain on disposal of assets	(1.5)	
Total operating expenses	36.7	52.8
Loss from operations	(62.7)	(75.9)
Other (expense) income	(0.4)	(1.9)
Loss before income taxes	(63.1)	(77.8)
Income tax benefit	0.2	
Net loss	\$ (62.9)	\$ (77.8)

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

	Year ended December 31,	
	2016	2015
Revenue	100%	100%
Cost of goods sold	232	197
Gross loss	(132)	(97)
Operating expenses:		
General and administrative	39	40
Sales and marketing	8	6
Research and development	13	10

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Long-lived asset impairment charge	135	166
Gain on disposal of assets	(8)	
Total operating expenses	187	222
Loss from operations	(319)	(319)
Other (expense) income	(2)	(8)
Loss before income taxes	(321)	(327)
Income tax benefit	1	
Net loss	(320%)	(327%)

Table of Contents**Comparison of years ended December 31, 2016 and 2015**

Revenue. Revenue was \$19.6 million for the year ended December 31, 2016 and \$23.8 million for the year ended December 31, 2015, a decrease of \$4.2 million. We experienced lower revenue from sales of our core products by \$9.8 million, of which \$7.0 million was attributable to a decrease in volume and \$2.8 million was attributable to a decrease in pricing. Revenue from sales of large-diameter polished and patterned wafers increased by \$6.5 million, of which \$11.1 million was attributable to an increase in volume, partially offset by \$4.6 million attributable to a decrease in price. Of the \$6.5 million increase in wafer sales, the increase in revenue from sales to the LED market of \$7.5 million was partially offset by a decrease in revenue from sales to the SoS market of \$1.0 million. Of the \$7.5 million increase in wafer sales to the LED market, polished wafer sales increased by \$4.7 million and PSS wafer sales increased by \$2.8 million. This was driven primarily by the full draw of consignment inventories by our largest LED customer. Revenue from optical products decreased by \$530,000 due to increased competition in the period for certain products with looser specifications. As we are nearing the completion of our LANCE government contract, we have experienced a decrease of \$372,000 in the R&D revenue attributable to this contract. The continual decline of prices has made the prospects of becoming profitable in the LED substrate market unlikely in the foreseeable future. As a result, we have decided to focus on the optical and industrial sapphire markets at this time. We have ceased all LED-related production activities and closed our Penang, Malaysia manufacturing facility and are in the process of reducing our U.S. operating footprint. This is expected to significantly decrease future LED revenue. We will continue to build a business more focused on the optical and industrial sapphire markets, where we believe we have greater differentiation from our competitors on products that require tighter specification, larger diameters, ultra-thin double side polished windows and U.S. sourcing. We believe there may be emerging applications in that market. We operate in an extremely volatile market, so our ability to expand our optical business and the acceptance of new product offerings is difficult to predict.

Gross loss. Gross loss was \$26.0 million and \$23.1 million for the years ended December 31, 2016 and 2015, respectively, an increase in loss of \$2.9 million. The increase in gross loss was primarily attributable to charges incurred in connection with our decision to exit the LED market and close our Malaysia facility, including a write-down of excess two-inch core inventory of \$2.4 million, an increase in raw material inventory write-down of \$1.5 million, a consumable stock write-down of \$3.2 million and severance expense of \$970,000 for the reduction in staffing in the U.S. and Malaysia. For the years ended December 31, 2016 and 2015, we were not operating at capacity and recorded costs associated with the lower utilization of equipment and staff of \$9.4 million and \$8.1 million, respectively, an increase of \$1.3 million. These charges were partially offset by a decrease in lower of cost or market inventory adjustments of \$2.9 million as these products were sold and a decrease in production costs of \$3.3 million due to improved production efficiency.

General and administrative expenses. G&A expenses were \$7.7 million and \$9.6 million for the years ended December 31, 2016 and 2015, respectively, a decrease of \$1.9 million. This decrease is attributable to a lower employee compensation costs of \$480,000 on lower headcount, decrease in bad debt expense of \$470,000 on lower revenue and improved collections, a decrease in recruiting costs of \$398,000, lower investor relations consulting expenditures of \$169,000, a decrease in information systems consulting and connectivity related expenses of \$133,000, a decrease in audit and tax consulting expense of \$130,000, and a decrease in travel expenses of \$99,000. Legal costs of \$900,000 were relatively the same for each of the years ended December 31, 2016 and 2015, as an increase in 2016 of \$900,000 of costs related to our proxy solicitation and annual meeting process, which involved a contested director election, was offset by a decrease of 2015 costs of \$900,000 related to a legal settlement expense.

Sales and marketing expenses. Sales and marketing expenses were \$1.4 million for each of the years ended December 31, 2016 and 2015.

Research and development expenses. R&D expenses were \$2.5 million and \$2.2 million for the years ended December 31, 2016 and 2015, respectively, an increase of \$340,000. This increase was attributable to the increased employee compensation costs of \$331,000 due to an increased headcount and an increase in project costs of \$58,000. Additionally, in 2016 we recorded the estimated costs of \$217,000 on the government contract in excess of the contract value. These charges were partially offset by a decrease of \$171,000 in depreciation on R&D equipment and a decrease in employee travel of \$53,000.

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 the third quarter of 2015, the overall outlook for the sapphire market continued to be depressed as industry analysts reported significant worldwide over capacity and pricing of sapphire products reached historical lows. At that time, we evaluated our long-lived

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assets using a cost and market approach to determine the current fair market value. Based on this analysis, an impairment to these assets was indicated, as the recoverable amount of undiscounted cash flows did not exceed the carrying amount of these assets. At December 31, 2015, we recorded an asset impairment charge on U.S. and Malaysia machinery, equipment and facilities of \$39.6 million.

In September 2016, we announced our decision to limit our focus to the optical and industrial sapphire markets and exit the LED and mobile device markets which resulted in the closing of our Malaysia facility. In the fourth quarter of 2016, we developed a plan to scale down our remaining operations and sell additional assets that would not be needed as we focus on the optical and industrial sapphire markets. In this regard, we identified excess U.S. machinery, equipment and facilities. We engaged an independent valuation company to assist us in the determination of the fair market 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 market 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 of a 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 prices are below the book values of these properties, for the year ended December 31, 2016, an impairment charge of \$14.3 million was recorded.

Other income (expense). Other expense was \$385,000 and \$1.9 million for the years ended December 31, 2016 and 2015, respectively, a decrease in other expense of \$1.5 million. The decrease is primarily attributable to a recognition in the year ended December 31, 2015 of the realized loss on foreign currency translation due to a weakening of the Malaysian Ringgit against the U.S. Dollar. The exchange rate of Malaysian Ringgit to U.S. Dollar remained at the same level during the year ended December 31, 2016.

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, 2016, a valuation allowance has been included in the 2016 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, at December 31, 2015, 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, 2016, we continue to be in a three-year cumulative loss position; therefore, as of December 31, 2016, 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.

The tax provision for the years ended December 31, 2016 and 2015 is based on an estimated combined statutory effective tax rate. We recorded for the year ended December 31, 2016 a tax benefit of \$223,000 and for the year ended December 31, 2015 a tax expense of \$26,000, for an effective tax rate of 0.4% and 0.0%, respectively. For the years ended December 31, 2016 and 2015, 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 and Malaysia foreign tax rate differential.

At December 31, 2016, we had separate Federal and Illinois NOLs of \$148.1 million and \$179.6 million, respectively, which begin to expire in 2021 and 2019, respectively. We have not recorded a deferred tax asset for NOLs, included in the aforementioned amounts, attributable to stock option exercises in the amount of \$21.7 million for federal purposes and \$26.4 million for state purposes because we cannot record these excess tax benefit stock option deductions until the benefit has been realized by actually reducing taxes payable. Last, 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, 2016, we had Federal and Illinois research and development credits and investment tax credits of \$668,000, \$68,600 and \$174,000, respectively which begin to expire in 2017.

LIQUIDITY AND CAPITAL RESOURCES

We have historically funded our operations using a combination of issuances of common stock and cash generated from our operations. On January 2, 2013, we entered into a three-year term loan agreement with a bank to provide us with a senior secured

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credit facility of up to \$25.0 million. The agreement provided for us 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. We 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 we 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 our personal property, excluding intellectual property. We were 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 our total worldwide cash, securities and investments, and we could pay dividends or repurchase capital stock only with the bank's consent during the three year term. In August 2015, we entered into an amendment 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 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 us to maintain a lockbox. As a result, we classified the debt as a current liability on our balance sheet.

Starting in December 2015, and from time to time in the year ended December 31, 2016, we borrowed and subsequently repaid \$1.5 million from our credit facility described below. For the years ended December 31, 2016 and 2015, we recorded interest expense of \$99,000 and \$109,000, respectively related to the credit facility which included \$92,000 and \$107,000, respectively of interest expense charged on the unused portion of the facility.

On September 9, 2016, we voluntarily terminated the credit facility. Pursuant to the related 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 us 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. We did not incur any early termination penalties in connection with the termination.

As of December 31, 2016, we had cash and cash equivalents totaling \$17.7 million, including cash of \$6.7 million held in deposits at major banks and \$11.0 million invested in money market funds. As of December 31, 2016, we had no short-term investments.

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, 2016 and 2015:

	Year ended December 31,	
	2016	2015
	(in millions)	
Net loss	\$ (62.9)	\$ (77.8)

Non-cash items:		
Depreciation and amortization	6.1	11.4
Net gain on disposal of assets	(1.5)	
Stock based compensation and other, net	1.3	1.3
Long-lived asset impairment charges	26.6	39.6
Deferred taxes	(0.6)	(0.1)
Total non-cash items:	31.9	52.2
Changes in working capital:		
Accounts receivable	(0.8)	6.6
Inventories	12.0	(3.7)
Inventory reserves	1.6	3.8
Prepaid expenses and other assets	5.6	2.4
Accounts payable	(2.4)	(0.2)
Other accruals	(0.3)	
Total working capital items:	15.7	8.9
Net cash used in by operating activities	\$ (15.3)	\$ (16.7)

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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 used in operating activities was \$16.7 million for the year ended December 31, 2015. During such period, we generated a net loss of \$77.8 million, which included non-cash charges of \$52.2 million, and an increase in cash from net working capital of \$8.9 million. The net cash from working capital was driven by a decrease in accounts receivable of \$6.6 million on lower revenue for the year, a decrease in other inventory supplies of \$2.2 million as we decreased our furnace component materials on hand, offset by a slight decrease in accounts payable of \$247,000 due to 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, 2016 and 2015:

	Year ended December 31,	
	2016	2015
	(in millions)	
Purchases of property and equipment	\$ (0.7)	\$ (1.0)
Purchases of investments		(2.3)
Proceeds from disposal of assets	5.3	
Proceeds from sale of investments	8.9	14.0
Net cash provided by investing activities	\$ 13.5	\$ 10.7

Net cash provided by investing activities was \$13.5 million and \$10.7 million for the years ended December 31, 2016 and 2015, respectively. 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.

In 2015, we used approximately \$941,000 to invest in PSS related equipment and other required upgrades. We used \$14.0 million from the sale of investments to fund our operations, offset by \$2.3 million in the purchase of investments.

Cash flows from financing activities

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.

Net cash provided by financing activities was \$1.5 million for the year ended December 31, 2015 which represents \$1.5 million from our credit facility to fund operations.

Future liquidity requirements

We believe that our existing cash, cash equivalents, anticipated cash flows from operating activities and proceeds from sales of fixed assets will be sufficient to meet our anticipated cash needs 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. Our cash needs include cash required to fund our operations, and the capital needed to fund any future expansion in the U.S. and investments in new product development. If

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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. On April 19, 2016, while our common stock was listed on the NASDAQ Global Market, we received notice from the Listing Qualifications Department of The NASDAQ Stock Market (NASDAQ) stating that we were not in compliance with NASDAQ 's minimum bid price requirement of \$1.00 per share for continued listing, because the closing bid price for our stock was below \$1.00 for 30 consecutive business days. We had an initial grace period of 180 calendar days to regain compliance with the minimum bid price requirement for continued listing. On October 18, 2016, we received approval from NASDAQ to transfer the listing of our common stock to the NASDAQ Capital Market effective on October 20, 2016. As a result of the transfer, we were granted an additional 180 calendar day grace period, or until April 17, 2017 to regain compliance with NASDAQ 's minimum bid price requirement. In order to regain compliance and qualify for continued listing on the NASDAQ Capital Market, the closing bid price of our common stock must be at least \$1.00 per share for a minimum of ten consecutive business days. In the event we do not regain compliance by April 17, 2017, we expect that NASDAQ will provide written notification to us that our common stock will be delisted. At that time, we may appeal the delisting determination to a NASDAQ Hearings Panel and our common stock would remain listed pending the panel 's decision. There can be no assurance that, if we appeal the delisting determination, such appeal would be successful. There is no assurance that our common stock will not be delisted. If our common stock was delisted, it would significantly impact our ability to raise funds through the issuance of equity. If we obtain debt financing, a substantial portion of our operating cash flow may be dedicated to the payment of principal and interest on such indebtedness, and the terms of the debt securities issued could impose significant restrictions on our operations. If we are unable to obtain financing, we may be unable to continue operations or successfully execute our business plan.

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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 Worldwide LLC, Rubicon Technology Hong Kong and Rubicon Technology Korea Yuhan Hosea's 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 Worldwide LLC, Rubicon Technology Hong Kong and Rubicon Technology Korea Yuhan Hosea 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. 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.

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

Inventory valuation

We value our inventory at the lower of cost or market. Market 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 weighted-average 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 year ended December 31, 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 \$139,000. At times during the year ended December 31, 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 year ended December 31, 2016 an adjustment which increased costs of goods sold and reduced inventory by \$1.1 million. In connection with the closing of our Malaysia facility and ceasing LED production, we determined we had excess two-inch core inventory and recorded a write-down of \$2.3 million. We also recorded for the year ended December 31, 2016, write-down of excess raw material inventory of \$4.0 million and consumable stock write-down expense of \$3.2 million. 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 year ended December 31, 2016, we determined that we were not operating at capacity and recorded costs associated with lower utilization of equipment and staff of \$9.4 million.

Investments

We invest available cash primarily in investment grade commercial paper, FDIC guaranteed certificates of deposits, corporate notes 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, 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

We review property and equipment for impairment whenever events or circumstances indicate that carrying amounts may not be recoverable. If such events or changes in circumstances occur, we will recognize an impairment loss if the undiscounted future cash flows expected to be generated by the assets are less than the carrying value of the related asset. The impairment loss would adjust the asset to its fair value.

In evaluating the recoverability of long-lived assets, we must make assumptions regarding estimated future cash flows and other factors to determine the fair value of such assets. If our fair value estimates or related assumptions change in the future, we may be required to record impairment charges related to property and equipment. Asset recoverability is first measured by comparing the assets' carrying amount to their expected future undiscounted net cash flows to determine if the assets are impaired. If such assets are considered to be impaired, the impairment recognized is measured based on the amount by which the carrying amount of the assets exceeds the fair value.

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In the third quarter of 2015, the overall outlook for the sapphire market continued to be depressed as industry analysts reported significant worldwide over capacity and pricing of sapphire products reached historical lows. We evaluated our long-lived assets using a cost and market approach to determine the current fair market value. Based upon this analysis, an impairment to these assets was indicated, as the recoverable amount of undiscounted cash flows did not exceed the carrying amount of these assets. At December 31, 2015, we recorded an asset impairment charge on U.S. and Malaysia machinery, equipment and facilities of \$39.6 million.

In September 2016, we announced our decision to limit our focus to the optical and industrial sapphire markets and exit the LED and mobile device markets which resulted in closing of our Malaysia facility. In the fourth quarter of 2016, we developed a plan to scale down our remaining operations and sell additional assets that would not be needed as we focus on the optical and industrial sapphire markets. In this regard, we identified excess U.S. machinery, equipment and facilities. We engaged an independent valuation company to assist us in the determination of the fair market 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 market 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 of a 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. Since it is our intention to complete a sale within the next twelve months, at December 31, 2016 these properties were reclassified as current assets held for sale.

Stock-based compensation

We expense stock options based upon the fair market 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.

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 \$1.3 million in stock compensation expense in each of the years ended December 31, 2016 and 2015, respectively.

All option grants made during the years ended December 31, 2016 and 2015 were 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, 2016, there is no aggregate intrinsic value of all stock options outstanding and exercisable.

In the year ended December 31, 2015, we granted Restricted Stock Units (RSUs) to certain key employees. 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. Each RSU granted will vest according to a specified vesting schedule at each anniversary of grant date and settle in common stock (on a one-for-one basis). 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.

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.

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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, 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. 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, 2016 and 2015, 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.

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 DISCLOSURE 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

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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, 2016.

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
- iii. provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or 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, 2016. 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, 2016, management concluded that the Company's internal control over financial reporting was effective.

Rubicon Technology, Inc.

March 16, 2017

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, 2016 that our certifying officers concluded materially affected, or are reasonably likely to materially affect, our internal controls over financial reporting.

ITEM 9B. OTHER INFORMATION

Following our decision to focus on the optical and industrial markets, on December 14, 2016, our Board of Directors determined to close our facility in Batavia, Illinois, and to consolidate our remaining U.S. operations into our leased space in Bensenville, Illinois and Franklin Park, Illinois. At that time, we had not reasonably determined that material charges would be incurred in connection with the Batavia shutdown under generally accepted accounting principles applicable to us. As part of the plan to scale down the remaining operations and sell additional assets that would not be needed, we determined to sell our excess equipment and real

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property in Batavia, including the special purpose facility. We engaged an independent valuation company to assist in the determination of the fair market value of assets to provide an updated valuation of the U.S. machinery and equipment and the facility in Batavia. 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 market value. We also evaluated 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 attempt to sell these assets. Based on this review, we reasonably concluded on January 20, 2017, the date we received the independent valuation report, that material charges would be incurred in connection with the shutdown of the Batavia facility. In February 2017, we finalized the amount of the charge after review by our auditors.

We recorded a non-cash asset impairment charge of approximately \$16.5 million in the fourth quarter of 2016 for the write-down of fixed assets including the Batavia facility and U.S. machinery and equipment. The shutdown of the Batavia facility resulted in a workforce reduction of approximately 43 employees. Severance costs were approximately \$370 thousand and were recognized in the fourth quarter of 2016 with the majority of cash payments made in the fourth quarter of 2016. In addition, we expect to incur charges related to the consolidation of our remaining U.S. operations in the amount of approximately \$280 thousand of which \$120 thousand was recorded and the majority paid in the fourth quarter of 2016 with the remainder expected to be recorded and paid in the first quarter 2017.

Table of Contents**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 2017 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 2017 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. 2001 Equity Plan, as amended, 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, 2016.

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
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	(a)	(b)	(a) (c)
Equity compensation plans approved by security holders(1)	2,661,244	\$ 3.73	2,432,184

(1) The Rubicon Technology Inc. 2001 Equity Plan, as amended, and the Rubicon Technology Inc. 2007 Stock Incentive Plan were 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 2017 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.

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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 2017 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 2017 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 2017 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.

Table of Contents**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>Report of Independent Registered Public Accounting Firm</u>	F-2
<u>Consolidated Balance Sheets as of December 31, 2016 and 2015</u>	F-3
<u>Consolidated Statements of Operations for each of the two years in the period ended December 31, 2016</u>	F-4
<u>Consolidated Statements of Comprehensive Loss for each of the two years in the period ended December 31, 2016</u>	F-5
<u>Consolidated Statements Stockholders' Equity for each of the two years in the period ended December 31, 2016</u>	F-6
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(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.

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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 16, 2017.

Rubicon Technology, Inc.

By /s/ William F. Weissman
William F. Weissman

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 16, 2017.

Signature	Title
/s/ William F. Weissman William F. Weissman	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/ Don N. Aquilano Don N. Aquilano	Chairman of the Board of Directors
/s/ Timothy E. Brog Timothy E. Brog	Director
/s/ Donald R. Caldwell Donald R. Caldwell	Director
/s/ Michael E. Mikolajczyk Michael E. Mikolajczyk	Director
/s/ Raymond J. Spencer Raymond J. Spencer	Director

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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	Eighth Amended and Restated Certificate of Incorporation of Rubicon Technology, Inc.	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)
3.1(a)	Amendment No. 1 to Eighth Amended and Restated Certificate of Incorporation of Rubicon Technology, Inc.	Filed as Appendix A to the registrant's Definitive Proxy Statement on Schedule 14A, filed on April 29, 2011 (File No. 1-33834)
3.2	Second Amended and Restated Bylaws of Rubicon Technology, Inc.	Filed as Exhibit 3.3 to the registrant's Quarterly Report on Form 10-Q, filed on May 10, 2016 (File No. 1-33834)
4.1	Specimen Common Stock Certificate	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)
10.1*	Rubicon Technology, Inc. 2001 Equity Plan, dated as of August 2, 2001	Filed as Exhibit 10.1 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)
10.1(a)*	Amendment No. 1 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of November 6, 2001	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)
10.1(b)*	Amendment No. 2 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of May 21, 2002	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)
10.1(c)*	Amendment No. 3 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of May 28, 2004	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)
10.1(d)*	Amendment No. 4 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of December 6, 2004	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)
10.1(e)*	Amendment No. 5 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of June 28, 2005	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)
10.1(f)*	Amendment No. 6 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of November 30, 2005	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)

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10.1(g)*	Amendment No. 7 to the Rubicon Technology, Inc. 2001 Equity Plan, dated as of July 26, 2006	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)
10.1(h)*	Rubicon Technology, Inc. 2001 Equity Plan Form of Notice of Stock Option Grant and Stock Option Agreement	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)
10.2*	Rubicon Technology, Inc. 2007 Stock Incentive Plan, as amended and restated, effective March 23, 2011	Filed as Exhibit 10.2 to the registrant's Annual Report on Form 10-K, filed on March 13, 2014 (File No. 1-33834)
10.3*	Rubicon Technology, Inc. 2016 Stock Incentive Plan	Filed as Appendix A to the registrant's Definitive Proxy Statement on Schedule 14A, filed on May 18, 2016 (File No. 1-33834)

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No.	Description	Incorporation by Reference
10.3(a)*	Form of Notice of Stock Option Grant and Stock Option Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan	Filed as Exhibit 10.2 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)
10.3(b)*	Form of Non-Employee Director Restricted Stock Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan	Filed as Exhibit 10.3 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)
10.3(c)*	Form of Restricted Stock Unit Agreement pursuant to Rubicon Technology, Inc. 2016 Stock Incentive Plan (with time-based vesting)	Filed as Exhibit 10.4 to the registrant's Quarterly Report on Form 10-Q, filed on August 9, 2016 (File No. 1-33834)
10.4*	Form of Indemnification Agreement for Directors and Officers	Filed as Exhibit 10.11 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)
10.5*	Form of Indemnification Agreement for Directors and Executive Officers	Filed as Exhibit 10.1 to the registrant's Quarterly Report on Form 10-Q, filed on May 8, 2015 (File No. 1-33834)
10.6*	Executive Employment Agreement by and between Rubicon Technology, Inc. and William F. Weissman, dated as of February 18, 2015	Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on February 19, 2015 (File No. 1-33834)
10.6(a)*	First Amendment to Executive Employment Agreement by and between Rubicon Technology, Inc. and William F. Weissman, dated as of December 1, 2015	Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on December 4, 2015 (File No. 1-33834)
10.7*	Executive Employment Agreement by and between Rubicon Technology, Inc. and Mardel A. Graffy, dated as of February 18, 2015	Filed as Exhibit 10.2 to the registrant's Current Report on Form 8-K, filed on February 19, 2015 (File No. 1-33834)
10.8*	Letter of Appointment by and between Rubicon Sapphire Technology (Malaysia) Sdn. Bhd and Hany Tamim, dated as of October 31, 2015	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)
10.9	Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of December 23, 2004	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)
10.9(a)	Amendment to Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of May 6, 2005	Filed as Exhibit 10.12 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)
10.9(b)	Second Amendment to Commercial Lease by and between Rubicon Technology, Inc. and Bartmanns, Perales & Dolter, LLC, dated as of December 23, 2014	Filed as Exhibit 10.11 to the registrant's Annual Report on Form 10-K, filed on March 13, 2015 (File No. 1-33834)
10.10		

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	Industrial Building Lease by and between Rubicon Technology, Inc. and Phillip J. Latoria, Jr., dated as of July 18, 2007	Filed as Exhibit 10.14 to the registrant's Registration Statement on Form S-1, filed on September 5, 2007 (File No. 333-145880)
10.10(a)	Second Amendment to Industrial Building Lease by and between Rubicon Technology, Inc. and Phillip J. Latoria, Jr., dated as of July 17, 2014	Filed as Exhibit 10.13 to the registrant's Annual Report on Form 10-K, filed on March 13, 2015 (File No. 1-33834)
10.11	Pay-Off Letter effective as of September 9, 2016	Filed as Exhibit 10.1 to the registrant's Current Report on Form 8-K, filed on September 15, 2016 (File No. 1-33834)
21.1**	Subsidiaries of the Company	
23.1**	Consent of Independent Registered Public Accounting Firm	
24.1**	Power of Attorney (incorporated by reference to the signature page of this Annual Report on Form 10-K)	

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Exhibit		
No.	Description	Incorporation by Reference
31.1**	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	
31.2**	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	
32.1**	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	
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.

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Rubicon Technology, Inc.

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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 sheets of Rubicon Technology, Inc. (a Delaware corporation) and subsidiaries (the Company) as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive income (loss), changes in stockholders' equity, and cash flows for each of the two years in the period 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 audits 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 audits provide 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 2015, and the results of their operations and their cash flows for each of the two years in the period 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

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Rubicon Technology, Inc.
Consolidated Balance Sheets

	As of December 31,	
	2016	2015
	(in thousands, other than share data)	
Assets		
Cash and cash equivalents	\$ 17,672	\$ 21,216
Restricted cash	163	170
Short-term investments		8,895
Accounts receivable, net	2,585	1,738
Inventories	8,000	21,333
Other inventory supplies	1,486	5,717
Prepaid expenses and other current assets	1,082	1,188
Assets held for sale	14,761	
Total current assets	45,749	60,257
Property and equipment, net	7,110	57,569
Other assets	154	1,416
Total assets	\$ 53,013	\$ 119,242
Liabilities and stockholders equity		
Accounts payable	\$ 948	\$ 3,256
Accrued payroll	182	164
Accrued and other current liabilities	602	1,328
Corporate income and franchise taxes	568	207
Accrued real estate taxes	241	238
Short-term loan payable		1,500
Advance payments	23	9
Total current liabilities	2,564	6,702
Deferred tax liability		554
Total liabilities	2,564	7,256
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, 40,000,000 shares authorized; 28,603,665 and 28,007,811 shares issued; 26,828,821 and 26,232,967 shares outstanding	29	28
Additional paid-in capital	374,903	373,565
Treasury stock, at cost, 1,774,844 shares	(12,148)	(12,148)
Accumulated other comprehensive loss	(30)	(33)

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Accumulated deficit	(312,305)	(249,426)
Total stockholders' equity	50,449	111,986
Total liabilities and stockholders' equity	\$ 53,013	\$ 119,242

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

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

	Year ended December 31,	
	2016	2015
	(in thousands, other than share data)	
Revenue	\$ 19,630	\$ 23,818
Cost of goods sold	45,638	46,961
Gross loss	(26,008)	(23,143)
Operating expenses:		
General and administrative	7,695	9,589
Sales and marketing	1,444	1,363
Research and development	2,550	2,210
Long-lived asset impairment charge	26,554	39,597
(Gain) loss on disposal of assets	(1,534)	47
Loss from operations	(62,717)	(75,949)
Other income (expense):		
Interest income	73	71
Interest expense	(99)	(109)
Realized loss on foreign currency translation	(359)	(1,869)
Total other expense	(385)	(1,907)
Loss before income taxes	(63,102)	(77,856)
Income tax benefit	223	26
Net loss	\$ (62,879)	\$ (77,830)
Net loss per common share		
Basic	\$ (2.39)	\$ (2.98)
Diluted	\$ (2.39)	\$ (2.98)
Weighted average common shares outstanding used in computing net loss per common share		
Basic	26,356,359	26,156,170
Diluted	26,356,359	26,156,170

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

Table of Contents**Rubicon Technology, Inc.****Consolidated Statements of Comprehensive Loss**

	Year ended December 31,	
	2016	2015
	(in thousands)	
Net loss	\$ (62,879)	\$ (77,830)
Other comprehensive income (loss):		
Unrealized gain on investments, net of taxes	5	10
Unrealized loss on currency translation	(2)	
Other comprehensive income	3	10
Comprehensive loss	\$ (62,876)	\$ (77,820)

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

Table of Contents**Rubicon Technology, Inc.****Consolidated Statements of Stockholders Equity**

	Common stock		Treasury stock		Additional paid-in capital	Accum other comp inc.	Stockholders equity	
	Shares	Amount	Shares	Amount			Accum deficit	Total stockholders equity
(in thousands other than share data)								
Balance at January 1, 2015	27,913,788	\$ 28	(1,774,844)	\$(12,148)	\$ 372,319	\$(43)	\$(171,596)	\$ 188,560
Exercise of stock options	5,692				4			4
Stock-based compensation					731			731
Restricted stock issued, net of restricted shares withheld for employee taxes	58,899				287			287
Common stock issued, net of shares withheld for employee taxes	29,432				224			224
Unrealized gain on investments, net of tax						10		10
Net loss							(77,830)	(77,830)
Balance at December 31, 2015	28,007,811	28	(1,774,844)	(12,148)	373,565	(33)	(249,426)	111,986
Exercise of stock options								
Stock-based compensation					527			527
Restricted stock issued, net of restricted shares withheld for employee taxes	529,896	1			558			559
Common stock issued, net of shares withheld for employee taxes	65,958				253			253
						(2)		(2)

Foreign currency translation adjustments									
Unrealized gain on investments, net of tax						5			5
Net loss							(62,879)		(62,879)

Balance at December 31, 2016	28,603,665	\$ 29	(1,774,844)	\$(12,148)	\$ 374,903	\$(30)	\$(312,305)	\$	50,449
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The accompanying notes are an integral part of these consolidated statements.

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

	Year ended December 31,	
	2016	2015
	(in thousands)	
Cash flows from operating activities		
Net loss	\$ (62,879)	\$ (77,830)
Adjustments to reconcile net loss to net cash (used in) operating activities		
Depreciation and amortization	6,100	11,404
Net (gain) loss on disposal of assets	(1,534)	47
Stock-based compensation	1,348	1,250
Long-lived asset impairment charge	26,554	39,597
Deferred taxes	(554)	(39)
Changes in operating assets and liabilities:		
Accounts receivable	(847)	6,585
Inventories	13,641	73
Other inventory supplies	4,263	2,166
Prepaid expenses and other assets	1,304	275
Accounts payable	(2,354)	(247)
Accrued payroll	22	(323)
Corporate income and franchise taxes	360	(63)
Accrued real estate taxes	2	(41)
Advance payments	14	(1)
Accrued and other current liabilities	(725)	431
Net cash used in operating activities	(15,285)	(16,716)
Cash flows from investing activities		
Purchases of property and equipment	(704)	(941)
Proceeds from disposal of assets	5,344	
Purchase of investments	(28)	(2,322)
Proceeds from sale of investments	8,928	14,000
Net cash provided by investing activities	13,540	10,737
Cash flows from financing activities		
Proceeds from exercise of options		4
Restricted cash	7	13
Net change in short-term borrowings	(1,500)	1,500
Taxes paid related to net share settlement of equity awards	(8)	(8)
Net cash (used in) provided by financing activities	(1,501)	1,509

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Net effect of currency translation	(298)	1,333
Net decrease in cash and cash equivalents	(3,544)	(3,137)
Cash and cash equivalents, beginning of year	21,216	24,353
Cash and cash equivalents, end of year	\$ 17,672	\$ 21,216
Supplemental disclosure of cash flow information		
Cash paid for interest	\$ 99	\$ 109

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

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Table of Contents**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 Worldwide LLC, Rubicon Sapphire Technology (Malaysia) SDN BHD, Rubicon Technology Hong Kong Limited and Rubicon Technology Korea Yuhan Hosea. 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, 2016 and 2015 is as follows:

	As of December 31,	
	2016	2015
	(in thousands)	
Certificates of deposit	\$ 5	\$ 5
Flexible spending funds	2	2
Fixed deposit pledge	156	163
	\$ 163	\$ 170

Foreign currency translation and transactions

Rubicon Worldwide LLC, Rubicon Technology Hong Kong Limited and Rubicon Technology Korea Yuhan Hosea's 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 Worldwide LLC, Rubicon Technology Hong Kong Limited and Rubicon Technology Korea Yuhan Hosea 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).

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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

The Company invests available cash primarily in investment grade commercial paper, FDIC guaranteed certificates of deposit, common stock, corporate notes 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 in order to support its current operations, 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, 2016 and 2015, 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 manufacturers serving the light-emitting diodes (LED) and optical systems and specialty devices industries. 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 bad debt expense.

Table of Contents**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,	
	2016	2015
	(in thousands)	
Beginning balance	\$ 389	\$ 140
Charges to costs and expenses	(235)	235
Accounts write offs, less recoveries	(123)	14
Ending balance	\$ 31	\$ 389

Inventories

Inventories are valued at the lower of cost or market. Raw materials cost is determined using the first-in, first-out method, and work-in-process and finished goods costs are determined on a weighted-average 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. The Company's method of estimating excess and obsolete inventory has remained consistent for all periods presented.

At times in 2016 and 2015, the Company has accepted sales orders for core and wafer products at prices lower than cost. Based on these sales prices, the Company has recorded for the years ended December 31, 2016 and 2015, a lower of cost or market adjustment which reduced inventory and increased cost of goods sold by \$1.1 million and \$3.9 million, respectively.

The continual decline of prices and 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 year ended December 31, 2016, an excess and obsolete adjustment was recorded which reduced inventory and increased cost of goods sold by \$2.3 million.

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.

Inventories are composed of the following:

	As of December 31,	
	2016	2015
	(in thousands)	
Raw materials	\$ 3,112	\$ 7,346
Work-in-process	4,251	9,920
Finished goods	637	4,067
	\$ 8,000	\$ 21,333

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Table of Contents**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 year ended December 31, 2016 a consumable stock write-down of \$3.2 million.

Property and equipment

Property and equipment consisted of the following:

	As of December 31,	
	2016	2015
	(in thousands)	
Land and land improvements	\$	\$ 4,133
Buildings		26,097
Machinery, equipment and tooling	17,769	50,364
Leasehold improvements	4,624	7,141
Information systems	991	1,105
Furniture and fixtures	699	816
Construction in progress	263	1,327
Total cost	24,346	90,983
Accumulated depreciation and amortization	(17,236)	(33,414)
Property and equipment, net	\$ 7,110	\$ 57,569

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 \$6.1 million and \$11.4 million for the years ended December 31, 2016 and 2015, 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
--------------------------	-------------

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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 respective useful lives.

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Table of Contents**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, 2016 2015 (in thousands)	
Balance, beginning of period	\$ 73	\$ 97
Charged to cost of sales	(1)	90
Actual product warranty expenditures	(45)	(114)
Balance, end of period	\$ 27	\$ 73

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, 2016 and 2015.

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 and accounts receivable. At December 31, 2016 and 2015, the Company had \$525,000 and \$419,000, respectively, on deposit at foreign financial institutions. At December 31, 2016 and 2015, the Company had \$6.0 million and \$2.9 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 currently depends on a small number of suppliers for certain raw materials, components, services and equipment, including key materials such as aluminum oxide powder and certain furnace components. If the supply of these components were to be disrupted or terminated, or if these suppliers were unable to supply the quantities of raw materials required, the Company may have difficulty in finding, or may be unable to find, alternative sources for these items. The Company also 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.

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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, 2016 and 2015, \$289,000 and \$661,000, respectively, of revenue were recorded. At December 31, 2016, the estimated costs to complete the contract were in excess of the contract value. For the year ended December 31, 2016, the Company accrued \$217,000 for the estimated costs of completion. To date, the Company has recorded \$4.3 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.

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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 \$2.5 million and \$2.2 million for the years ended December 31, 2016 and 2015, 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, 2016 and 2015.

The Company is subject to taxation in the U.S., Japan 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 the 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. Due to the existence of net operating loss carryforwards, tax years ended December 31, 2001 through 2006, 2008, 2009 and 2011 through 2015 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 2015 are open to examination by state tax authorities. Tax years 2013 through 2015 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, 2016 and 2015, 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.

Table of Contents**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, 2016 and 2015 follows:

	Year Ended December 31,	
	2016	2015
	(in thousands)	
Reclassification of unrealized gain included in net loss	\$	\$
Unrealized loss on investments, net of tax	(12)	(17)
Unrealized loss on currency translation	(18)	(16)
Ending balance	\$ (30)	\$ (33)

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, 2016 and 2015 because the effects of potentially dilutive securities are anti-dilutive.

As of December 31, 2016 and 2015, diluted shares outstanding were the same as basic shares outstanding.

New accounting pronouncements adopted

In August 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2014-15 (ASU 2014-15), *Presentation of Financial Statements - Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern*. The standard requires management to evaluate whether there is substantial doubt about an entity's ability to continue as a going concern and to provide related footnote disclosures. Management must evaluate whether it is probable that known conditions or events, considered in the aggregate, would raise substantial doubt about the entity's ability to continue as a going concern within one year after the date that the financial statements are issued. If such conditions or events are identified, the standard requires management's mitigation plans to alleviate the doubt or a statement of the substantial doubt about the entity's ability to continue as a going concern to be disclosed in the financial statements. The Company adopted ASU

2014-15 at December 31, 2016. Under ASU 2014-15, the Company's negative financial trends of recurring operating losses and negative cash flow from operating activities are considered conditions or events that raise substantial doubt about the Company's ability to continue as a going concern. The Company has plans in place that are considered as probable to effectively mitigate the adverse conditions. Activities around the Company's restructuring and mitigation plans are more fully disclosed in Note 5 Asset Impairment Charges.

Recent accounting pronouncements

In July 2015, the FASB issued ASU No. 2015-11 (ASU 2015-11), *Inventory (Topic 330): Simplifying the Measurement of Inventory*. The amendments in this ASU require an entity to measure in-scope inventory at the lower of cost or net realizable value, further clarifying consideration for net realizable value as estimated selling prices in the ordinary course of business less reasonably predictable costs of completion, disposal and transportation. This ASU more closely aligns the measurement of inventory in GAAP with the measurement of inventory in International Financial Reporting Standards (IFRS). For public business entities, ASU 2015-11 is effective for annual periods and interim periods beginning after December 15, 2016. The amendments in this ASU are prospectively applied with early adoption permitted. The Company is evaluating the impact, if any, of adopting ASU 2015-11 on its financial statements and does not believe the adoption will significantly impact the presentation of its financial condition, results of operations and disclosures.

In January 2016, the FASB issued ASU No. 2016-01 (ASU 2016-01), *Financial Instruments Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities*. The standard requires equity investments (except those

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accounted for under the equity method of accounting, or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income, requires public business entities to use the exit price notion when measuring the fair value of financial instruments for disclosure purposes, requires separate presentation of financial assets and financial liabilities by measurement category and form of financial asset, and eliminates the requirement for public business entities to disclose the method(s) and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost. These changes become effective for fiscal years beginning after December 15, 2017. The Company is evaluating the impact, if any, of adopting ASU 2016-01 on its financial statements.

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.

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. ASU 2016-09 is effective for annual reporting periods beginning after December 15, 2016 with early adoption permitted. The Company is evaluating the impact, if any, of adopting ASU 2016-09 on its financial statements.

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. While the Company is currently assessing the impact of the new standards, 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. The Company does not expect this new guidance to have a material impact on the amount of overall sales recognized; however, the timing of sales on certain projects may be affected. The Company has not yet quantified this potential impact.

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 is in the process of performing its initial assessment of the potential impact on its Consolidated Financial Statements and has not decided on its adoption methodology. The Company is evaluating the impact, if any, of adopting ASU 2016-15 on its 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 is evaluating the impact, if any, of adopting ASU 2017-01 on its financial statements.

Table of Contents**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,	
	2016	2015
	(in thousands)	
Germany	\$ 8,945	\$ 3,718
United States	3,364	4,894
Malaysia	2,880	
Korea	1,486	3,646
Canada	876	522
Taiwan	847	3,490
Australia	509	913
Israel	398	785
China	222	5,499
Other	103	351
Total revenue	\$ 19,630	\$ 23,818

The following table summarizes sales by product type:

	Year Ended December 31,	
	2016	2015
	(in thousands)	
Wafer	\$ 13,121	\$ 6,627
Optical	4,568	5,086
Core	1,652	11,444
Research & development	289	661
Total revenue	\$ 19,630	\$ 23,818

Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

The following table summarizes assets by geographic region:

	As of December 31,	
	2016	2015
	(in thousands)	
United States	\$ 47,171	\$ 88,916
Malaysia	5,811	30,276
Other	31	50
Total assets	\$ 53,013	\$ 119,242

3. INVESTMENTS

The Company invests available cash primarily in FDIC guaranteed certificates of deposits and corporate notes. The Company's investments are classified as available-for-sale securities and are carried at fair market value with unrealized gains and losses recorded in accumulated other comprehensive income (loss). The Company did not have any short-term investments as of December 31, 2016.

The following table presents the amortized cost, and gross unrealized gains and losses on all securities at December 31, 2015:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(in thousands)			
Short-term investments:				
FDIC guaranteed certificates of deposit	\$ 1,920	\$	\$	\$ 1,920
Corporate notes/bonds	6,980		5	6,975
Total short-term investments	\$ 8,900	\$	\$ 5	\$ 8,895

Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

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, 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
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Table of Contents**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, 2015:

	Level 1	Level 2	Level 3	Total
	(in thousands)			
Cash equivalents:				
Money market funds	\$ 17,702	\$	\$	\$ 17,702
Investments:				
Available-for-sales securities - current:				
FDIC guaranteed certificates of deposit		1,920		1,920
Corporate notes/bonds		6,975		6,975
Total	\$ 17,702	\$ 8,895	\$	\$ 26,597

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 \$6.7 million and \$3.5 million of time deposits included in cash and cash equivalents as of December 31, 2016 and 2015, respectively.

4. SIGNIFICANT CUSTOMERS

For the year ended December 31, 2016, the Company had one customer that accounted for approximately 60% of its revenue. For the year ended December 31, 2015, the Company had two customers that accounted for approximately 16% and 15% of its revenue.

Customers individually representing more than 10% of trade receivables accounted for approximately 75% and 48% of accounts receivable as of December 31, 2016 and 2015, 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. 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 the third quarter of 2015, the overall outlook for the sapphire market continued to be depressed as industry analysts reported significant worldwide over capacity and pricing of sapphire products reached historical lows. The Company at that time evaluated its long-lived assets using a cost and market approach to determine the current fair market value. Based on this analysis, an impairment to these assets was indicated, as the recoverable amount of undiscounted cash flows did not exceed the carrying amount of these assets. At December 31, 2015, the Company recorded an asset impairment charge on U.S. and Malaysia machinery, equipment and facilities of \$39.6 million.

In September 2016, due to the continual decline of prices that has made the prospects of becoming profitable in the LED substrate market 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. 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 market 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 market 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.

The Company is actively pursuing the sale 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. These properties have a combined book value of \$14.8 million and, since it is the Company's intention to complete the sale within the next twelve-month period, these properties were reclassified as current assets held for sale at December 31, 2016.

At December 31, 2016, the Company reviewed the current fair market value of the Malaysia assets and concluded no additional adjustments were needed. 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 market value.

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) (in thousands)	Significant unobservable inputs (Level 3)	Loss for twelve months ended December 31, 2016
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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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, 2015 and loss recorded during the twelve months ended December 31, 2015 on those assets:

	Carrying value at December 31, 2015	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2) (in thousands)	Significant unobservable inputs (Level 3)	Loss for twelve months ended December 31, 2015
Long lived assets held and used	\$ 57,569	\$	\$ 57,569	\$	\$ 39,597

6. STOCKHOLDERS EQUITY**Common stock**

As of December 31, 2016 the Company had reserved 2,661,244 shares of common stock for issuance upon the exercise of outstanding common stock options and vesting of restricted stock units. Also, 2,432,184 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, 2016. In addition, 24,380 shares of the Company's common stock were reserved for future exercise of outstanding warrants as of December 31, 2015.

Warrants

At December 31, 2015, the Company had outstanding 24,380 warrants to purchase shares of common stock at an exercise price of \$3.65 per share. The warrants were issued in conjunction with the issuance of convertible promissory notes issued by the Company to investors from August 2005 through October 2005. The warrants were immediately exercisable and expired 10 years from the date of issuance. These warrants expired during the year ended December 31, 2016.

Treasury stock

The treasury shares are accounted for using the cost method whereby the entire cost of the acquired stock is recorded as treasury stock. The Board of Directors approved an arrangement to pay to one of its directors in cash one-half of the fees payable to him for director services in the fourth quarter of 2016; this resulted in the disposition to the Company of 33,476 shares of restricted stock previously granted to the director in exchange for a cash payment of \$21,093, which represented the then-current fair market value of the shares. The Company did not repurchase any shares for the twelve months ended December 31, 2015.

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

The Company sponsored a stock option plan, the Rubicon Technology, Inc. 2001 Equity Plan, as amended (the 2001 Plan), which allowed for the granting of incentive and nonqualified stock options for the purchase of common stock. The maximum number of shares that could be awarded or sold under the 2001 Plan was 1,449,667 shares. Each option granted under the 2001 Plan entitled the holder to purchase one share of common stock at the specified option exercise price. The exercise price of each incentive stock option granted could not be less than the fair market value on the grant date. Management and the Board of Directors determined vesting periods and expiration dates at the time of the grant. On August 2, 2011, the 2001 Plan expired. Any existing options under the 2001 Plan remain outstanding in accordance with their current terms under the 2001 Plan.

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 4,407,692 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.

On June 24, 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 Company's Board of Directors 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, 2,229,803 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
Outstanding at January 1, 2015	1,772,529	2,238,286	\$ 10.31	140,653	134,731
Granted	(1,457,826)	992,684	1.40	60,802	404,340

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Exercised		(5,692)	0.78		(29,432)
Canceled/forfeited	417,567	(373,710)	10.02		(55,618)
Outstanding at December 31, 2015	732,270	2,851,568	7.07	201,455	454,021
Authorized	1,900,000				
Granted	(1,537,692)	943,620	0.63	594,072	
Exercised/issued					(133,685)
Canceled/forfeited	1,337,606	(1,259,783)	8.96	(30,701)	(194,497)
Outstanding at December 31, 2016	2,432,184	2,535,405	\$ 3.73	764,826	125,839

The following table sets forth option grants made during 2016 and 2015 with intrinsic value calculated based on grant date fair value.

Date of grant	Number of options granted	Exercise price	Intrinsic value per share
March July 2015	92,600	\$2.43 - \$4.04	
September December 2015	900,084	\$1.00 - \$1.35	
January April 2016	51,120	\$0.73 - \$1.14	
September 2016	892,500	\$0.61	

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.

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At December 31, 2016, the exercise prices of outstanding options were as follows:

Exercise price	Number of options outstanding	Average remaining contractual life (years)	Number of options exercisable
\$0.61 - \$0.73	874,250	9.74	
\$1.00 - \$1.35	725,019	8.86	196,438
\$2.43 - \$5.20	548,439	5.90	467,564
\$6.11 - \$12.16	206,692	2.89	200,567
\$15.00 - \$19.49	132,476	2.85	132,476
\$20.20 - \$32.67	48,529	3.76	48,529
	2,535,405	7.62	1,045,574

The weighted average grant date fair value of the options that became vested in the years ended 2016 and 2015 was \$928,000 and \$1.3 million, respectively.

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

	Non-vested options	Weighted-average option exercise price
Non-vested at January 1, 2015	628,733	\$ 5.93
Granted	992,684	1.40
Vested	(200,402)	6.64
Cancelled	(169,054)	5.86
Non-vested at December 31, 2015	1,251,961	2.23
Granted	943,620	0.63
Vested	(330,115)	2.81
Cancelled	(375,635)	2.51
Non-vested at December 31, 2016	1,489,831	\$ 1.02

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 market value of the common stock

at December 31, 2016 and 2015, there was no aggregate intrinsic value for options outstanding and exercisable.

For the years ended December 31, 2016 and 2015, 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 and 2015 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, 2016 and 2015 the Company recorded \$527,000 and \$731,000, respectively, of stock option compensation expense. As of December 31, 2016, the Company has \$780,000 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 2.86 years.

Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

For the years ended December 31, 2016 and 2015, 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	2015
Weighted average fair value per share of option	\$0.63	\$1.40
Expected term	5.1 years	5.5 years
Risk free interest rate	1.24% -1.73%	1.41% -1.70%
Volatility	65%	65%
Dividend yield	None	None
Forfeiture rate	23.1%	18.56%

The Company continues to account for options issued prior to January 1, 2006 under the intrinsic value method.

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, 2015	134,731	\$ 5.41	
Granted	404,340	1.48	
Vested	(29,432)	5.44	
Cancelled	(55,618)	5.37	
Non-vested restricted stock units as of December 31, 2015	454,021	1.92	
Granted			
Vested	(133,685)	1.60	
Cancelled	(194,497)	2.35	
Non-vested at December 31, 2016	125,839	\$ 1.60	\$ 75,503

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, 2016 and 2015, the Company recorded \$262,000 and \$224,000 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, 2016, there was \$168,000 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 1.53 years.

An analysis of restricted stock issued is as follows:

Non-vested restricted stock as of January 1, 2015	12,207
Granted	60,802
Vested	(57,809)
Non-vested restricted stock as of December 31, 2015	15,200
Granted	594,072
Vested	(413,870)
Cancelled/Forfeited	(30,701)
Non-vested restricted stock as of December 31, 2016	164,701

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Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

For the years ended December 31, 2016 and 2015, the Company recorded \$559,000 and \$295,000, respectively, of stock compensation expense related to restricted stock.

In 2013, the Board of Directors awarded 47,050 shares of restricted stock and 70,365 stock options to key executives at a price of \$7.97, the closing price of the shares on the date of the grant. Vesting of the shares was subject to achievement of specified targets by December 31, 2013 and March 31, 2014. All of the milestones were achieved by the specified dates. As of December 31, 2014, 20,911 restricted shares and 31,274 stock options were cancelled. As of December 31, 2015, the remaining restricted shares were vested.

8. INCOME TAXES

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

(Loss) before income taxes

	Year ended December 31,	
	2016	2015
	(in thousands)	
U.S.	\$ (50,689)	\$ (67,254)
Foreign	(12,413)	(10,602)
Total	\$ (63,102)	\$ (77,856)

Income taxes

	Year ended December 31,	
	2016	2015
	(in thousands)	
<i>Current</i>		
U.S.	\$	\$
State		
Foreign	331	13
Total current income tax expense	331	13
<i>Deferred</i>		
U.S.		
State		

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Foreign	(554)	(39)
Total deferred income tax (benefit)	(554)	(39)
Total income tax (benefit)	\$ (223)	\$ (26)

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

	Year ended December 31,	
	2016	2015
U.S. Federal statutory rate	(34.0)%	(34.0)%
State taxes net of federal benefit	(4.1)	(4.4)
Foreign rate differential and transactional tax	1.8	1.2
Impact of foreign tax holiday	(0.9)	3.4
Valuation allowance	36.6	33.3
Other	0.2	0.5
	0.4%	%

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.

Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

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

	2016	2015
	(in thousands)	
Deferred tax assets:		
Allowance for doubtful accounts	\$ 12	\$ 152
Inventory reserves	3,855	3,289
Accrued liabilities	11	382
Warrant interest expense	269	269
Stock compensation expense	2,774	2,478
State net operating loss net of tax	9,189	7,456
Net operating loss carryforward	50,284	40,417
Tax credits	825	671
Depreciation	4,995	
Valuation allowance	(72,199)	(52,286)
Total deferred tax assets	15	2,828
Deferred tax liability:		
Depreciation		(3,320)
Prepaid expenses	(15)	(62)
Net deferred tax liability	\$	\$ (554)

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 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, 2016 and 2015, a valuation allowance of \$72.2 million and \$52.3 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

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Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)**

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. The net deferred tax liabilities at December 31, 2015 are related to tax liabilities that will reverse after the expiration of the Malaysia tax holiday as discussed below.

At December 31, 2016, the Company had separate Federal and Illinois net operating loss carryforwards (NOL) of \$148.1 million and \$179.6 million, respectively, which begin to expire in 2021 and 2019, respectively. The Company has not recorded a deferred tax asset for NOL, included in the aforementioned amounts, attributable to stock option exercises in the amount of \$21.7 million for federal purposes and \$26.4 million for state purposes because the Company cannot record these excess tax benefit stock option deductions until the benefit has been realized by actually reducing taxes payable. Last, the Company has 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, 2016, the Company had Federal and Illinois research and development credits and investment tax credits of \$668,000, \$68,600 and \$174,000, respectively which begin to expire in 2017. 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, 2016. 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, 2016 and 2015, 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, 2015	\$ 1,141
Decrease related to prior year positions	
Tax position related to current year	
Balance at December 31, 2016	\$ 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, 2016 and 2015. Included in the balance of total unrecognized tax benefits at December 31, 2015, are potential benefits of \$1.0 million that if recognized, would affect the effective tax rate in the year recognized.

Table of Contents**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 Japan and is subject to local income taxes in both jurisdictions. The Company is exempt from Malaysian income tax for a five-year period beginning in 2009 with a five year renewal. Due to the continual decline in prices in the sapphire market, 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. The impact of this tax holiday decreased foreign taxes for the year ended December 31, 2015 by approximately \$147,000 and the benefit on net income per share (diluted) for the year ended December 31, 2015 was \$0.01. 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 2015 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 2015 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, 2016, the Company accrued the withholding tax on the interest balance of the loan in the amount of \$274,000, 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 years ended December 31, 2016 and 2015, the Company recorded interest expense of \$99,000 and \$109,000, respectively related to the credit facility which includes \$92,000 and \$107,000, respectively of interest expense charged on the unused portion of the facility.

Table of Contents**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 2016 and 2015 amounted to \$598,900 and \$653,400, respectively.

Future minimum payments under all leases are as follows:

Year ending December 31,	Operating leases (in thousands)
2017	\$ 592
2018	468
2019	145
Balance at December 31, 2016	\$ 1,205

Purchase Commitments

The Company has entered into agreements for electricity. These agreements will result in the Company purchasing electricity for a total cost of approximately \$771,000 with deliveries occurring through December 2017.

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, other than as set forth below, will have a material adverse effect on the financial condition or results of operations of the Company.

On April 30, 2015, Firerock Global Opportunity Fund LP filed a complaint in the Northern District of Illinois asserting federal securities claims against the Company, certain officers, its directors and the underwriters in the Company's March 2014 stock offering. The complaint sought as a remedy either money damages or rescission of the March 2014 offering, plus attorneys' fees. On October 29, 2015, after mediation and subsequent discussions, the parties reached a settlement agreement in principle. On January 27, 2016, the United States District Court for the Northern District of Illinois granted a motion for preliminary approval of the agreement, and on May 20, 2016, a final judgment and order of dismissal was granted. The settlement included a release of all defendants, and dismissal of the case against all defendants with prejudice. The Company recorded for the year ended December 31, 2015 an expense

of \$1.1 million of which \$900,000 is the amount the Company contributed to the settlement and paid on February 17, 2016. The remaining costs of the settlement were covered by the Company's insurance carriers.

On November 19, 2015, the Carolyn Piper Smithhisler Living Trust, derivatively on behalf of Rubicon Technology Inc., filed a complaint in the Eighteenth Judicial Circuit of Illinois against the Company's Board of Directors and certain senior officers seeking to remedy alleged breaches of fiduciary duties and other violations of the law, failure to implement an effective system of internal controls, and failure to oversee the public statements made by the Company and certain individual defendants. The complaint sought as a remedy to recover damages against the individual defendants for the benefit of the Company and to require the Company to reform and improve its corporate governance and internal procedures plus attorneys' fees. After extensive discussions, the parties informed the court on May 2, 2016 that they had reached a settlement agreement in principle. On May 23, 2016, the court issued an order granting preliminary approval of the proposed settlement. On July 11, 2016, plaintiff's unopposed motion for final approval of stockholder derivative settlement fee and expense amount and service award was filed. On August 1, 2016, the court issued a final judgment approving the settlement and an order of dismissal was granted. The settlement provided for the Company to adopt certain governance changes and to pay certain amounts. The Company's insurance carriers covered substantially all of the settlement payments and related expenses, including legal fees.

Table of Contents**Rubicon Technology, Inc.****Notes to Consolidated Financial Statements (Continued)****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, 2016 and 2015.

12. QUARTERLY FINANCIAL DATA (Unaudited)**Quarterly Financial Data (Unaudited)**

Summary quarterly results for the two years ended December 31, 2016 are as follows (in thousands, other than share and per share data):

2016	Three months ended				
	March 31	June 30	September 30	December 31	Full year
Revenue	\$ 4,287	\$ 3,535	\$ 7,086	\$ 4,722	\$ 19,630
Gross loss	\$ (5,419)	\$ (4,051)	\$ (11,646)	\$ (4,891)	\$ (26,008)
Loss from operations	\$ (8,156)	\$ (8,150)	\$ (24,769)	\$ (21,642)	\$ (62,717)
Loss before income taxes	\$ (7,484)	\$ (8,383)	\$ (25,017)	\$ (22,218)	\$ (63,102)
Net loss	\$ (7,333)	\$ (8,209)	\$ (24,801)	\$ (22,536)	\$ (62,879)
Basic and diluted loss per common share	\$ (0.28)	\$ (0.31)	\$ (0.94)	\$ (0.85)	\$ (2.39)
Weighted average common shares outstanding used in computing net loss per common share, basic and diluted:	26,226,614	26,296,398	26,374,516	26,527,909	26,356,359

2015	Three months ended				
	March 31	June 30	September 30	December 31	Full year
Revenue	\$ 8,910	\$ 7,106	\$ 5,346	\$ 2,456	\$ 23,818
Gross loss	\$ (5,109)	\$ (5,155)	\$ (3,891)	\$ (8,988)	\$ (23,143)
Loss from operations	\$ (7,948)	\$ (8,322)	\$ (47,370)	\$ (12,309)	\$ (75,949)
Loss before income taxes	\$ (8,312)	\$ (8,529)	\$ (48,859)	\$ (12,156)	\$ (77,856)
Net loss	\$ (8,348)	\$ (8,580)	\$ (48,196)	\$ (12,706)	\$ (77,830)
Basic and diluted loss per common share	\$ (0.32)	\$ (0.33)	\$ (1.84)	\$ (0.49)	\$ (2.98)
Weighted average common shares outstanding used in	26,129,276	26,142,261	26,160,308	26,192,838	26,156,170

computing net loss per
common share, basic and
diluted:

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