RUDOLPH TECHNOLOGIES INC
Form 10-K
February 16, 2017
Table of Contents

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

_____

FORM 10-K

_____

(Mark One)

x 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

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

For the transition period from to

Commission File No. 001-36226

_____

RUDOLPH TECHNOLOGIES, INC.
(Exact name of registrant as specified in its charter)

_____

Delaware	22-3531208
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

16 Jonspin Road, Wilmington, MA 01887
(Address of principal executive offices) (Zip Code)
Registrant's telephone number, including area code: (978) 253-6200

_____

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of Each Class	Name of Exchange on Which Registered
Common Stock, $0.001 par value per share (including attached Series A Junior Participating Preferred Stock Purchase Rights)	New York Stock Exchange (NYSE)

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 o No x

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

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 x No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No o

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. o

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. (Check one):

Large accelerated filer o	Accelerated filer x	Non-accelerated filer o (Do not check if a smaller reporting company)	Smaller reporting company o

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

The aggregate market value of the voting stock held by non-affiliates of the registrant based on the closing price of the registrant's stock price on June 30, 2016 of $15.53 was approximately $468,614,163.

The registrant had 31,238,967 shares of Common Stock outstanding as of January 25, 2017.

DOCUMENTS INCORPORATED BY REFERENCE

Items 10, 11, 12, 13 and 14 of Part III of this Annual Report on Form 10-K incorporate by reference information from the definitive proxy statement for the registrant's annual meeting of stockholders scheduled to be held on May 17, 2017.

TABLE OF CONTENTS

Table of Contents

FORWARD LOOKING STATEMENTS

Certain statements in this Annual Report on Form 10-K are forward-looking statements, including those concerning our business momentum and future growth, the benefit to customers and market acceptance of our products and customer service, our ability to deliver both products and services consistent with our customers' demands and expectations and strengthen our market position, our expectations of the semiconductor market outlook, future revenues, gross profits, research and development and engineering expenses, selling, general and administrative expenses, product introductions, technology development, manufacturing practices, cash requirements, our dependence on our largest customers for a significant portion of our revenue and anticipated trends and developments in and management plans for, our business and the markets in which we operate, our anticipated revenue as a result of acquisitions, and our ability to be successful in managing our cost structure and cash expenditures and results of litigation. The statements contained in this Annual Report on Form 10-K that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, Section 21E of the Securities Exchange Act of 1934, as amended, and within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements may be identified by the words such as, but not limited to, "anticipate," "believe," "expect," "intend," "plan," "should," "may," "could," "will" and words or phrases of similar meaning, relate to our management or us.

The forward-looking statements contained herein reflect our expectations with respect to future events and are subject to certain risks, uncertainties and assumptions. The forward-looking statements reflect our position as of the date of this report and we undertake no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. Actual results may differ materially from those included in such forward-looking statements for a number of reasons including, but not limited to, the following: variations in the level of orders which can be affected, among other factors, by general economic conditions, seasonality, growth rates in the semiconductor manufacturing industry and in the markets served by our customers, and the global economic and political climates; difficulties or delays in product functionality or performance; the delivery performance of sole source vendors; the timing of future product releases; failure to respond adequately to either changes in technology or customer preferences; changes in pricing by us or our competitors; our ability to manage growth; changes in management; risk of nonpayment of accounts receivable; changes in budgeted costs; our ability to leverage our resources to improve our position in our core markets, our ability to weather difficult economic environments; our ability to open new market opportunities and target high-margin markets; the strength/weakness of the back-end and /or front-end semiconductor market segments; our ability to successfully integrate acquired businesses, into our business and fully realize, or realize within the expected time frame, the expected combination benefits from any such acquisition; and the "Risk Factors" set forth in Item 1A. You should carefully review the cautionary statements and "Risk Factors" contained in this Annual Report on Form 10-K. You should also review any additional disclosures and cautionary statements and "Risk Factors" we include from time to time in our quarterly reports on Form 10-Q, current reports on Form 8-K and other filings we make with the Securities and Exchange Commission.

PART I

Item 1. Business.

General

Rudolph Technologies, Inc. ("Rudolph" or the "Company") is a worldwide leader in the design, development, manufacture and support of process control defect inspection and metrology, advanced packaging lithography, and data analysis systems and software used by microelectronics device manufacturers. We provide process and yield management solutions used in both wafer processing and final manufacturing through a family of standalone systems for macro-defect inspection, lithography, probe card test and analysis, and transparent and opaque thin film measurements. All Rudolph systems feature sophisticated software and production-worthy automation. In addition,

our advanced process control software portfolio includes powerful solutions to enhance productivity and achieve significant cost savings. Rudolph systems are backed by worldwide customer service and applications support. Rudolph continues to drive the technological innovation of its inspection and metrology products to deliver solutions that address the demanding needs across the front-end and back-end processes of semiconductor manufacturing. In 2016, Rudolph unveiled a new inspection suite that includes high-resolution inspection for front- and back-end applications (Firefly™ series) and high-speed two-dimensional (2D) inspection (Dragonfly™ system). The Firefly series features Clearfind™ Technology, a patented technique for enhancing the detection of defects that

Table of Contents

often escape conventional illumination techniques by fluorescing organic materials, thereby reducing a source of yield-robbing interconnect failures.

As advanced packaging continues to drive process development in the semiconductor industry, the demand for lower cost with higher performance has driven manufacturers to develop innovative solutions. One new approach to reducing overall cost is to switch from (round) wafers to a larger-size rectangular panel format. Research group Yole Developpement describes the cost advantages and economy of scale benefits as key enablers propelling the growth of advanced packaging processes such as fan-out, interposers and embedded die panel packages. Rudolph is poised to play an integral role in this transition with its panel lithography and inspection solutions.

The need for more process monitoring and control continues to increase for semiconductor and related industries. Predictive analytics can lower maintenance costs, rate of scrap wafers, unscheduled tool downtime and material costs. Rudolph's established fault detection and classification software, which is incorporated into tools manufactured Veeco Instruments, allows customers to seamlessly turn equipment data into actionable operational information. This collaboration is designed to enhance etch and deposition tool performance.

Industry Trends

Advanced Packaging refers to a series of technology that enables the miniaturization of electronic products, such as portable consumer devices, including smartphones and laptops. In electronics manufacturing, integrated circuit packaging is the final stage of semiconductor device fabrication, in which the tiny block of semiconducting material (die) is encased in a supporting package that provides an external electrical connection and prevents physical damage and corrosion. Packaging refers loosely to the conductors and other structures that interconnect the semiconductor circuits, feed them with electric power, discharge their heat and protect them from damage. Today, the drive to pack more functions into a small space and reduce their power requirements demands that chip packages do much more than ever before. Examples of advanced packaging are varied and include flip-chip bumping, pillar bumping, wafer-level chip scale packaging and 3D packaging.

One technology used in advanced packaging is the 3D integration of semiconductors and other devices. The technology involves stacking individual die or wafers in one integrated housing. Through-silicon vias (TSV, 3D stacking) are the interconnects that allow communication among the individually stacked components. This offers the advantages of shorter signal paths and in turn reduced power consumption, enhanced bandwidths, integration of heterogeneous components such as sub-chips, smaller surface area and reduced expense. The processes required for 3D integration are still being optimized for yield, and to ensure the functioning of individual microchips.

Fan-out on wafer/panel level is another advanced packaging technology that is being used within the industry as the next disruptive technology for several reasons. First, it simplifies the manufacturing process by eliminating the need for micro bumps, C4 bumps, through-silicon via (TSV) and interposers. Next, it improves cost by eliminating the need for a substrate, which accounts for 35 percent of the packaging cost. Lastly, the technology is being considered as the vehicle for next generation uses such as multiple die packages and may even extend into package on package formats. Because of its low form factor, it is seen within the industry as essential for mobile and wearable products.

The current and projected adoption of smart mobile devices with designed-in capability to enable multiple functions in a single device continues to grow. In reality, there are no longer single function devices, but instead, a combined single device provides multiple functions. For example, smartphone users no longer need a separate GPS, digital camera and PDA. Aided by a myriad of available "apps," the potential uses seem endless. As a result, these added functions in mobile products are driving semiconductor advanced packaging and display manufacturers to implement next-generation technologies to meet these requirements. These technology shifts are creating multiple opportunities for Rudolph solutions.

Panel Manufacturing. In order to meet the growing demand at reduced average selling price, manufacturers are looking to scalable technology. Advanced packaging facilities looking to improve Cost of Ownership ("COO") and increase productivity are transitioning to large rectangular panels ranging up to Gen 3.5 (approximately 650mm x 720mm). Traditional technology has been limited to standard wafer sizes (200mm, 300mm). However, with companies progressively moving to larger area packages, they are no longer limited to operating within the constraints

of a round wafer. By responding to market opportunities and addressing the stringent demands of customers' technical roadmaps, Rudolph is optimally positioned to capitalize on the emerging market of high volume panel manufacturing. The JetStep

Table of Contents

S Series, having emerged from the flat panel display market, is readily capable of processing both glass and organic laminate panels in the semiconductor advanced packaging market. The Firefly S Series, designed for high resolution inspection, provides a combination of defect sensitivity and substrate flexibility in a single platform. It reduces capital investment requirements and provides a reliable pathway to transition from wafer to panel-based processes.

Technology

We believe that our expertise in engineering and our continued investment in research and development enable us to rapidly develop new technologies and products in order to quickly respond to emerging industry trends. The breadth of our technology enables us to offer a diverse combination of process and process control solutions. Unique features have been designed into our lithography systems to meet our customers' changing process requirements. Our metrology and inspection technologies provide process control for the majority of wafers processed today in semiconductor manufacturing. In front-end processes, thin film metrology and defect detection and classification technologies allow yield enhancement for critical processes such as photolithography, diffusion, etch, CMP and outgoing quality control. Within the final manufacturing (back-end) processes, advanced macro defect inspection provides our customers with critical quality assurance and process information. Defects may be created during probing, bumping, dicing or general handling, and can have a major impact on device and process quality. Lastly, we turn all of the data gathered into useful knowledge for our customers to make yield-enhancing decisions.

Process Control Business

Macro Defect Inspection. Chip manufacturers deploy advanced macro defect inspection throughout the fab to monitor key process steps, gather process-enhancing information and ultimately, lower manufacturing costs. Field-established tools such as the F30™ and NSX inspection systems are found in wafer processing (front-end) and final manufacturing (back-end) facilities around the world. These high-speed tools incorporate features such as waferless recipe creation, tool-to-tool correlation and multiple inspection resolutions. In addition, to wafer frontside inspection, Rudolph's innovative Explorer® Platform allows wafer edge and backside inspection in one integrated platform to enhance productivity and continuously improve fab yield. Using Discover® yield management software, the vast amounts of data gathered through automated inspection can be analyzed and classified to determine trends that ultimately affect yield.

All-Surface Inspection. All-surface refers to inspection of the wafer frontside, edge, and backside as well as post-fab die. The edge inspection process focuses on the area near the wafer edge, an area that poses difficulty for traditional wafer frontside inspection technology due to its varied topography and process variation. Edge bevel inspection looks for defects on the side edge of a wafer. Edge bead removal and edge exclusion metrology involve a topside surface measurement required exclusively in the photolithography process, primarily to determine if wafers have been properly aligned for the edge exclusion region. The primary reason for wafer backside inspection is to determine if contamination has been created that may spread throughout the fab. For instance, it is critical that the wafer backside be free of defects prior to the photolithography process to prevent focus and exposure problems on the wafer frontside.

Residue Detection. Residue is difficult or impossible to see with conventional white light imaging techniques. Residue contaminants are often the root cause of field failures, which occur after the material has been exposed to normal operating conditions for extended periods. Rudolph's new Clearfind™ technology highlights residue on bumps and bond pads or at the bottoms of vias so that they are easy to detect. On metals, it eliminates the high-contrast graininess seen under conventional illumination, resulting in an obvious defect signal against a featureless background. This same graininess in conventional imaging can also cause false positives, which are especially costly at this stage of the process where the sunk cost of unnecessarily rejected good product is high. Finally, Clearfind technology readily detects shorts and opens in metal lines when inspected with an underlying organic layer.

Automated Defect Classification and Pattern Analysis. Automating the defect detection and classification process is best done by a system that can mimic, or even extend, the response of the human eye, but at a much higher speed, with higher resolution and more consistency. To do this, our systems capture full-color whole wafer images using simultaneous dark and bright field illumination. The resulting bright and dark field images are compared to those from an "ideal" wafer having no defects. When a difference is detected, its image is broken down into mathematical vectors

that allow rapid and accurate comparison with a library of known classified defects stored in the tool's database. Patented and proprietary enhancements of this approach enable very fast and highly repeatable image classification. The system is pre-programmed with an extensive library of default local, global and color defects and can also absorb a virtually unlimited amount of new defect classes. This allows customers to define defects based on their existing defect

Table of Contents

classification system, provides more reliable automated rework decisions and enables more accurate statistical process control data. Reviewing defects off-line enables automated inspection systems to maintain their utilization for high throughput inspection. Using defect image files captured by automated inspection systems, operators are able to view high-resolution defect images to determine defects that cause catastrophic failure of a device, or killer defects. Combining the review process with classifying defects enables faster analysis by grouping defects found together as one larger defect, a scratch for example, and defects of similar types across a wafer lot to be grouped based on size, repeating defects and other user-defined specifications.

Yield Analysis. Using wafer maps, charts and graphs, the vast amounts of data gathered through automated inspection can be analyzed to determine trends across bumps, die, wafers and lots. This analysis may determine where in the process a variation is being introduced, allowing for enhancements to be made, thus yields improved. Defect data analysis is performed to identify, analyze and locate the source of defects and other manufacturing process excursions. Using either a single wafer map or a composite map created from multiple wafer maps, this analysis enables identification of defect patterns and distribution. When combined with inspection data from strategically-placed inspection points, this analysis may pinpoint the source of the defects so corrective action can be taken.

Probe Card Test and Analysis. The combination of Fast 3D-OCM® (optical comparative metrology) Technology with improved testing accuracy and repeatability is designed to reduce total test time for even the most advanced large area probe cards. The 3D capabilities enable users to analyze probe marks and probe tips in a rapid and information-rich format.

Optical Acoustic Metrology. Optical acoustic metrology involves the use of ultra-fast laser induced sonar for metal and opaque thin film measurement. This technology sends ultrasonic waves into multi-layer opaque films and then analyzes the resulting echoes to simultaneously determine the thickness of each individual layer in complex multi-layer metal film stacks. The echo's amplitude and phase can be used to detect film properties, missing layers and interlayer problems. Since different phenomena affect amplitude and phase uniquely, a variety of process critical interlayer problems can be detected in a single measurement. The use of optical acoustics to measure multi-layer metal and opaque films was pioneered by scientists at Brown University ("Brown") in collaboration with engineers at Rudolph. The proprietary optical acoustic technology in our PULSE™ technology systems measures the thickness of single or multi-layer opaque films ranging from less than 40 Angstroms to greater than five microns. It provides these measurements at a rate of up to 70 wafers per hour within one to two percent accuracy and typically less than one percent repeatability. This range of thicknesses covers the majority of thick and thin metal films projected by the International Roadmap for Semiconductors to be used through the end of this decade. Our non-contact, non-destructive optical acoustic technology and small spot size enable our PULSE Technology systems to measure film properties directly on product wafers.

Opaque Film Metrology. The MetaPULSE® System gives customers the ability to simultaneously measure the thickness and other properties of up to six metal or other opaque film layers without contacting in a non-destructive manner on product wafers. PULSE Technology uses an ultra-fast laser to generate sound waves that pass down through a stack of opaque films such as those used in copper or aluminum interconnect processes, sending back to the surface an echo that indicates film thickness, density, and other process critical parameters. We believe we are a leader in providing systems that can measure opaque thin-film stacks non-destructively with the speed and accuracy semiconductor device manufacturers demand in order to achieve high yields with the latest fabrication processes. The technology is ideal for characterizing copper interconnect structures. The MetaPULSE System, used mainly for fast and accurate measurements of metal interconnect in front-end wafer processing applications, has now been chosen by back-end manufacturers to perform system measurements in new process applications, driven by the need for on-product metrology as feature sizes decrease and pattern densities increase.

Ellipsometry. Ellipsometry is a non-contact, non-destructive optical technique for transparent thin film measurement. We have been an industry leader in ellipsometry technology for the last three decades. We hold patents on several ellipsometry technologies, including our proprietary technique that uses four lasers for multiple-angle of incidence, multiple wavelength ellipsometry. Laser ellipsometry technology enables our transparent film systems to provide the

increasingly higher level of accuracy needed as thinner films and newer materials are introduced for future generations of semiconductor devices. We extended this same optical technology to characterize the scatterometry signal from patterned surfaces, allowing measurement of critical dimensions.

Reflectometry. For applications requiring broader spectral coverage, some of our ellipsometry tools are also equipped with a reflectometer. Reflectometry uses a white or ultraviolet light source to determine the properties of

Table of Contents

transparent thin films by analyzing the wavelength and intensity of light reflected from the surface of a wafer. This optical information is processed with software algorithms to determine film thickness and other material properties. By combining data from both the laser ellipsometer and broad spectrum reflectometer, it is possible to characterize films and film stacks that cannot be adequately analyzed by either method individually.

Transparent Film Metrology. Rudolph's patented transparent film technology uses up to four lasers operating simultaneously at multiple angles and multiple wavelengths, providing powerful analysis and measurement capabilities. Unlike the white-light sources used in spectroscopic ellipsometers, laser light sources make our metrology tools inherently stable, increase measurement speed and accuracy, and reduce maintenance costs by minimizing the time required to re-qualify a light source when it is replaced. Rudolph's S3000SX™ System is targeted for transparent films in advanced semiconductor fabrication applications at the 28nm node and below. The S3000 product family uses Rudolph's proprietary Focused Beam Ellipsometry ("FBE") and newly-designed Small Site Measurement Optics ("SSMO") to measure the thickness of single layer and multi-layer films on product wafers including device area at site sizes as small as 30x30 nanometers.

Lithography Business

Step and Repeat Technology. Rudolph steppers use projection optics to expose circuit patterns from a mask or reticle onto a substrate to achieve images with optimal fidelity. These systems employ light from a mercury arc lamp that is transmitted through a mask or reticle containing display circuit patterns. Substrates are aligned on the system and the mask is imaged through a projection lens in photoresist material coated on the substrate. The substrate is then moved, or "stepped," to a second position to expose an adjacent area. Images can be "stitched" together precisely to form larger circuit patterns without any noticeable change in circuit performance. The system repeats the step and exposure process until the entire substrate is patterned. Once the exposure process has been completed, the substrate is developed with an alkali solution to reveal the underlying material. The imaged photoresist serves as a stencil barrier that allows for the processing of the underlying metal or insulating layers. The substrates then continue through the etching, stripping and deposition processes until multi-layer circuits are completed.

Advanced Packaging Lithography Systems. In order to deal with increased input/output ("I/O") resulting from devices with enhanced functionality, power efficiency and higher frequency, integrated device manufacturers ("IDMs") and outsourced semiconductor assembly and test facilities ("OSATs") must improve the lithography capabilities for their advanced packaging technologies. However, the associated substrates and processes are significantly different than those used in front-end wafer processing. For advanced packaging, the lithography system must meet the performance required for finer features. Additionally, since most packaging is an additive process, thick films are used to enable the creation of features. In order for equipment to effectively function in this environment, it must overcome these challenges. Rudolph's JetStep Systems have been specifically designed to meet these challenges head on. The JetStep W Series is designed for wafers and other round substrates while the JetStep S Series is designed for rectangular substrates (panels). Both systems boast a large printable field, which when combined with user-selectable wavelength options, maximizes throughput while not limiting resolution when needed. High fidelity optics are able to image the fine features required while at the same time achieving superior depth of field to minimize non-flatness effects. On-the-fly auto focus and an innovative reticle management system improve yield and utilization. These features result in a revolutionary lithography system specifically designed to meet advanced packaging challenges.

Flat Panel Display ("FPD") Lithography. A critical aspect of any leading mobile device is the display. The display serves as the window to the user. Therefore, it must effectively present graphics such as detailed maps, high resolution photos and streaming video in order to provide an enhanced user experience. To accomplish this, the display transistor backplane, which is what controls the individual pixels, must operate at a high frequency and not limit the pixel resolution. As a result, the transistors must have high mobility and only use a small portion of the pixel aperture. The backplane is manufactured on a sheet of glass; like the packaging substrate, it is non-flat and tends to distort further during processing. Additionally, the displays are getting larger. Manufacturers are looking to utilize larger glass substrates, making throughput a challenge for the lithography equipment. To overcome this, Rudolph's JetStep G Series uses high-fidelity optics and the largest printable stepper field available enabling more displays per shot. This feature, combined with on-the-fly auto-focus and magnification compensation, maximizes throughput and yield.

Finally, our patented grid stage allows the system to be easily configurable to meet the customer desired substrate size.

Table of Contents

Integrated Software Solutions

Process Control Software. We provide a wide range of advanced process control solutions, all designed to improve factory profitability, including run-to-run control, fault detection, classification and tool automation. Rudolph is a leading provider of Process Control Software in the semiconductor industry. Advanced process control (APC) employs software to automatically detect or predict tool failure (fault detection) as well as calculate recipe settings for a process that will drive the process output to target despite variations in the incoming material and disturbances within the process equipment. Process control software enables the factory to increase capacity and yield while decreasing rework and scrap. It enables reduced production costs by lowering consumables, process engineering time and manufacturing cycle time.

Yield Management Software. Semiconductor manufacturers use YMS to obtain valuable process yield and equipment productivity information. The data necessary to generate productivity information comes from many different sources throughout the fab: inspection and metrology systems, tool sensors, tool recipes, electrical tests and the fab environment. As the complexity and cost of manufacturing processes increase, the value of faster, better analysis to support critical manufacturing decisions grows. As a result, customers are demanding robust yield management systems that can analyze large, complex data sets quickly and effectively. Rudolph's fully-integrated YMS are designed to analyze data from disparate sources and multiple sites to maximize productivity across the entire value chain.

Products

Rudolph markets and sells products to major logic, memory, data storage, flat panel, application-specific integrated circuit ("ASIC") device and packaging manufacturers. Our customers rely on us for versatile inspection, lithography and metrology systems as well as process control software solutions. These products are designed for high-volume production facilities and offer automated wafer handling for 200mm, 300mm and 450mm configurations. Our systems operate at high throughput in ultra-clean operation with high reliability.

PROCESS CONTROL SYSTEMS

Product	First Introduced	Functionality	Type of Fab	
			Wafer Processing	Final Manufacturing
AMX™ 6000 Series	2011	Automated mask blank inspection system	X	
AWX™ Series	2011	Unpatterned wafer inspection and process monitoring system	X	X
B30™ Inspection Module	2003	Defect inspection module for the wafer's backside	X	X
E30™ Inspection Module	2003	Defect inspection module for the wafer's edge	X	X
Explorer® Inspection Platform	2009	Handling platform that supports a family of multi surface inspection tools, using one or more inspection modules	X	
F30™ Inspection Module	2011	Front-side macro defect inspection system	X	
Firefly™ Inspection Series	2016	Sub-micron defect and residue inspection	X	X

Table of Contents

PROCESS CONTROL SYSTEMS

Product	First Introduced	Functionality	Type of Fab: Wafer Processing	Type of Fab: Final Manufacturing
MetaPULSE® System	1997	Opaque (metal) thin film metrology system	X	X
NSX® Inspection System	1997	2D/3D wafer, die and bump inspection system		X
PrecisionWoRx® System	2008	Probe card test and analysis system		X
Reflex TT™ System	2000	Manual load bare wafer inspection system	X	
Reflex TT™ MBI System	2004	Manual load mask inspection system	X	
S3000™ System	2006	Transparent thin film metrology system	X	
SONUS® System	2014	Acoustic thick film metrology and defect inspection system		X
Wafer Scanner™ Inspection System	1999	2D/3D bump dimensional inspection		X

LITHOGRAPHY SYSTEMS

Product	First Introduced	Functionality	Type of Fab: Flat Panel Display	Type of Fab: Final Manufacturing
JetStep® W Lithography System	2012	2x reduction step and repeat system for advanced packaging applications on wafers or round substrates		X
JetStep® S Lithography System	2013	2x reduction step and repeat system for advanced packaging lithography on square or rectangular substrates up to Gen 3.5 size		X
JetStep® G35 FPD Lithography System	2006	Step and repeat lithography printer for Gen 3.5 substrates	X	
JetStep® G45 FPD Lithography System	2007	Step and repeat lithography printer for Gen 4.5 substrates	X	

Table of Contents

INTEGRATED SOLUTIONS SOFTWARE

Product	First Introduced	Functionality	Type of Fab Wafer Processing	Type of Fab Final Manufacturing
AutoShell® Software	1998	Equipment and factory automation software	X	X
ControlWORKS® Software	1994	Advanced equipment control software	X	
Discover® Software	2007	Tool-centric yield management system	X	X
Discover® Enterprise Software	2005	Fabwide yield management system	X	X
Equipment Sentinel™ Software	2015	Fault detection and classification software	X	X
GateWay™ Software	2003	Data collection and facilitation to FDC software	X	X
Process Sentinel® Software	2006	Fabwide spatial process control system	X	
ProcessWORKS® Software	1998	Run-to-run process control software	X	
RecipeWORKS™ Software	1998	Factory-level client-server based recipe management system	X	X
TrueADC® Enterprise Software	2007	Automatic defect classification software	X	X
Yield Optimizer™ Software	2006	Yield enhancement model software	X	
Genesis® Software	1997	Off-line yield management system	X	

Customers

Over 100 microelectronic device manufacturers have purchased Rudolph tools and software for installation at multiple sites. We support a diverse customer base in terms of both geographic location and type of device manufactured. Our customers are located in 20 countries. See Note 13 to our consolidated financial statements in this Annual Report on Form 10-K for information concerning our geographic information.

We depend on a relatively small number of customers and end users for a large percentage of our revenues. In the years 2016, 2015 and 2014, sales to end user customers that individually represented at least five percent of our revenues accounted for 34.5%, 23.3% and 23.9% of our revenues, respectively.

No individual end user customer accounted for more than 10% of our revenue in 2016, 2015 and 2014. We do not have purchase contracts with any of our customers that obligate them to continue to purchase our products.

Research and Development

The markets for equipment and systems for manufacturing semiconductor devices and for performing macro-defect inspection, advanced packaging lithography and thin film transparent and opaque process control metrology are characterized by continuous technological development and product innovations. We believe that the rapid and ongoing development of new products and enhancements to existing products is critical to our success. Accordingly, we devote a significant portion of our technical, management and financial resources to research and development programs. As of December 31, 2016, we employed 184 research and development personnel.

Table of Contents

Our research and development expenditures in 2016, 2015 and 2014 were $45.0 million, $41.2 million and $40.6 million, respectively. We expect to continue our strong commitment to new product development and continue to allocate significant resources to these efforts in the future.

Sales, Customer Service and Application Support

We maintain an extensive network of direct sales, customer service and application support offices in the United States, Europe and Asia.

We provide our customers with comprehensive support before, during and after the delivery of our products. For example, in order to facilitate the smooth integration of our tools into our customers' operations, we often assign dedicated, site-specific field service and applications engineers to provide long-term support at selected customer sites. We also provide comprehensive service and applications training for customers at our training facilities in Bloomington, Minnesota and Budd Lake, New Jersey and at customer locations. In addition, we maintain a group of highly skilled applications scientists at strategically located facilities throughout the world and at selected customer locations. As of December 31, 2016, we employed 251 sales and marketing, service and applications support personnel.

Manufacturing

Our principal manufacturing activities include assembly, final test and calibration. These activities are conducted in our manufacturing facilities in Bloomington, Minnesota and Wilmington, Massachusetts. Our core manufacturing competencies include electrical, optical and mechanical assembly and testing, as well as the management of new product transitions. While we use standard components and subassemblies wherever possible, most mechanical parts, metal fabrications and critical components used in our products are engineered and manufactured to our specifications. We continue to rely on subcontractors and turnkey suppliers to fabricate components, build assemblies and perform other non-core activities in a cost-effective manner. As of December 31, 2016, we employed 79 manufacturing personnel.

We rely on a number of limited source suppliers for certain parts and subassemblies. This reliance creates a potential inability to obtain an adequate supply of required components, and reduced control over pricing and time of delivery of components. An inability to obtain adequate supplies would require us to seek alternative sources of supply or might require us to redesign our systems to accommodate different components or subassemblies. To date, we have not experienced any significant delivery delays. However, if we were forced to seek alternative sources of supply, manufacture such components or subassemblies internally, or redesign our products, this could prevent us from shipping our products to our customers on a timely basis, which could have a material adverse effect on our operations.

Intellectual Property

We have a policy of seeking patents on inventions governing new products or technologies as part of our ongoing research, development, and manufacturing activities. As of December 31, 2016, we have been granted, or hold exclusive licenses to, 268 U.S. and foreign patents. The patents we own, jointly own or exclusively license have expiration dates ranging from 2017 to 2035. We also have 87 pending regular and provisional applications in the U.S. and other countries. Our patents and applications principally cover various aspects of macro-defect detection and classification, transparent thin film measurement, altered material characterization, lithography techniques and automation.

We have been granted exclusive licenses from Brown University Research Foundation, subject to rights retained by Brown and the United States government for their own non-commercial uses, for several patents relating to the optical acoustic technology underlying our MetaPULSE product family. The terms of these exclusive licenses are equal to the lives of the patents. We pay royalties to Brown based upon a percentage of our revenues from the sale of systems that incorporate technology covered by the Brown patents. We also have the right to support patent activity with respect to new ultra-fast acoustic technology developed by Brown scientists, and to acquire exclusive licenses to this technology.

Brown may terminate the licenses if we fail to pay royalties to Brown or if we materially breach our license agreement with Brown.

Our pending patents may never be issued, and even if they are, these patents, our existing patents and the patents we license may not provide sufficiently broad protection to protect our proprietary rights, or they may prove to be unenforceable. To protect our proprietary rights, we also rely on a combination of copyrights, trademarks, trade secret laws, contractual provisions and licenses. There can be no assurance that any patents issued to or licensed by us will

Table of Contents

not be challenged, invalidated or circumvented or that the rights granted thereunder will provide us with a competitive advantage.

The laws of some foreign countries do not protect our proprietary rights to the same degree as do the laws of the United States, and many U.S. companies have encountered substantial infringement problems in protecting their proprietary rights against infringement in such countries, some of which are countries in which we have sold and continue to sell products. There is a risk that our means of protecting our proprietary rights may not be adequate. For example, our competitors may independently develop similar technology or duplicate our products. If we fail to adequately protect our intellectual property, it would be easier for our competitors to sell competing products.

Competition

The market for semiconductor capital equipment is highly competitive. We face substantial competition from established companies in each of the markets that we serve. We principally compete with KLA-Tencor, Camtek and Ultratech. We compete to a lesser extent with companies such as Nanometrics, Nova Measuring Instruments and Nikon. Each of our products also competes with products that use different metrology and inspection techniques. Some of our competitors have greater financial, engineering, manufacturing and marketing resources, broader product offerings and service capabilities and larger installed customer bases than we do.

Significant competitive factors in the market for inspection and metrology systems include system performance, ease of use, reliability, cost of ownership, technical support and customer relationships. We believe that, while price and delivery are important competitive factors, the customers' overriding requirement is for a product that meets their technical capabilities. To remain competitive, we believe we will need to maintain a high level of investment in research and development and process applications. No assurances can be given that we will continue to be competitive in the future.

Backlog

We schedule production of our systems based upon order backlog and informal customer forecasts. We include in backlog only those orders to which the customer has assigned a purchase order number and for which delivery is anticipated within 12 months. Because shipment dates may be changed and customers may cancel or delay orders with little or no penalty, our backlog as of any particular date may not be a reliable indicator of actual sales for any succeeding period. At December 31, 2016, we had a backlog of approximately $41.6 million compared with a backlog of approximately $54.0 million at December 31, 2015.

Employees

As of December 31, 2016, we had 579 employees. Our employees are not represented by any collective bargaining agreements, and we have never experienced a work stoppage. We believe our employee relations are good.

Available Information

We were incorporated in Delaware in 1999. The Internet website address of Rudolph Technologies, Inc. is http://www.rudolphtech.com. The information on our website is not incorporated into this Annual Report. The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K (and any amendments to those reports) are made available free of charge, on or through our Internet website, as soon as reasonably practicable after such material is electronically filed with or furnished to the Securities and Exchange Commission, or SEC. All filings we make with the SEC are also available free of charge via EDGAR through the SEC's website at http://www.sec.gov.

We also make available, free of charge, through the investors page on our corporate website, Rudolph Technologies' corporate summary, Code of Business Conduct and Ethics and Financial Code of Ethics, charters of the committees of our Board of Directors, as well as other information and materials, including information about how to contact our Board of Directors, its committees and their members. To find this information and obtain copies, visit our website at http://www.rudolphtech.com.

10

Table of Contents

Item 1A. Risk Factors.

Risks Related to Rudolph

Our operating results have varied, and will likely continue to vary significantly, from quarter to quarter in the future, causing volatility in our stock price

Our quarterly operating results have varied in the past and will likely continue to vary significantly from quarter to quarter in the future, causing volatility in our stock price. Some of the factors that may influence our operating results and subject our stock to extreme price and volume fluctuations include:

- changes in customer demand for our systems, which is influenced by economic conditions in the semiconductor device industry, demand for products that use semiconductors, market acceptance of our systems and products of our customers and changes in our product offerings;
- seasonal variations in customer demand, including the tendency of European sales to slow significantly in the third quarter of each year;
- the timing, cancellation or delay of customer orders, shipments and acceptance;
- a significant portion of our revenue may be derived from the sale of a relatively small number of systems and accordingly, a small change in the number of systems we sell may cause significant changes in our operating results;
- product development costs, including increased research, development, engineering and marketing expenses associated with our introduction of new products and product enhancements; and
- the levels of our fixed expenses, including research and development costs associated with product development, relative to our revenue levels.

In light of these factors and the cyclical nature of the semiconductor industry, we expect to continue to experience significant fluctuations in quarterly and annual operating results. Moreover, many of our expenses are fixed in the short-term which, together with the need for continued investment in research and development, marketing and customer support, limits our ability to reduce expenses quickly. As a result, declines in net sales could harm our business and the price of our common stock could substantially decline.

Our largest customers account for a significant portion of our revenues, and our revenues and cash flows could significantly decline if one or more of these customers were to purchase significantly fewer of our systems or they delayed or canceled a large order

Sales to end user customers that individually represent at least five percent of our revenues typically account for, in the aggregate, a considerable amount of our revenues. We operate in the highly concentrated, capital-intensive semiconductor device manufacturing industry. Historically, a significant portion of our revenues in each quarter and year has been derived from sales to relatively few customers, and this trend is expected to continue. If any of our key customers were to purchase significantly fewer of our systems in the future, or if they delay or cancel a large order, our revenues and cash flows could significantly decline. We expect that we will continue to depend on a small number of large customers for a significant portion of our revenues. In addition, as large semiconductor device manufacturers seek to establish closer relationships with their suppliers, we expect that our customer base will become even more concentrated.

Our customers may be unable to pay us for our products and services

Our customers include some companies that may from time to time encounter financial difficulties, especially in light of the current economic environment and the difficulties in the credit markets. If a customer’s financial difficulties become severe, the customer may be unwilling or unable to pay our invoices in the ordinary course of business, which could adversely affect collections of both our accounts receivable balance and unbilled services. The bankruptcy of a customer with a substantial account receivable could have a material adverse effect on our financial condition and results of operations. In addition, if a customer declares bankruptcy after paying us certain invoices, a court may determine that we are not properly entitled to that payment and may require repayment of some or all of the amount we received, which could adversely affect our financial condition and results of operations.

Table of Contents

Variations in the amount of time it takes for us to sell our systems may cause fluctuations in our operating results, which could cause our stock price to decline

Variations in the length of our sales cycles could cause our revenues and cash flows, and consequently, our business, financial condition, operating results and cash flows, to fluctuate widely from period to period. This variation could cause our stock price to decline. Our customers generally take a long time to evaluate our inspection and/or film metrology systems and many people are involved in the evaluation process. We expend significant resources educating and providing information to our prospective customers regarding the uses and benefits of our systems in the semiconductor fabrication process. The length of time it takes for us to make a sale depends upon many factors including, but not limited to:

- the efforts of our sales force;
- the complexity of the customer's fabrication processes;
- the internal technical capabilities and sophistication of the customer;
- the customer's budgetary constraints; and
- the quality and sophistication of the customer's current metrology, inspection or lithography equipment.

Because of the number of factors influencing the sales process, the period between our initial contact with a customer and the time when we recognize revenue from that customer and receive payment, if ever, varies widely in length. Our sales cycles, including the time it takes for us to build a product to customer specifications after receiving an order to the time we recognize revenue, typically range from six to twenty-four months. Sometimes our sales cycles can be much longer, particularly with customers in Japan. During these cycles, we commit substantial resources to our sales efforts in advance of receiving any revenue, and we may never receive any revenue from a customer despite our sales efforts. If we do make a sale, our customers often purchase only one of our systems, and then evaluate its performance for a lengthy period before purchasing any more of our systems. The number of additional products a customer purchases, if any, depends on many factors, including the customer's capacity requirements. The period between a customer's initial purchase and any subsequent purchases can vary from six months to a year or longer, and variations in the length of this period could cause further fluctuations in our operating results and possibly in our stock price.

Most of our revenues have been derived from customers outside of the United States subjecting us to operational, financial and political risks, such as unexpected changes in regulatory requirements, tariffs, political and economic instability, outbreaks of hostilities, and difficulties in managing foreign sales representatives and foreign branch operations as well as risks associated with foreign currency fluctuations

Due to the significant level of our international sales, we are subject to a number of material risks, including:

Compliance with foreign laws. Our business is subject to risks inherent in doing business internationally, including compliance with, inconsistencies among, and unexpected changes in, a wide variety of foreign laws and regulatory environments with which we are not familiar, including, among other issues, with respect to employees, protection of our intellectual property, and a wide variety of operational regulations and trade and export controls under domestic, foreign, and international law.

Unexpected changes in regulatory requirements including tariffs and other market barriers. The semiconductor device industry is a high-visibility industry in many of the European and Asian countries in which we sell our products. Because the governments of these countries have provided extensive financial support to our semiconductor device manufacturing customers in these countries, we believe that our customers could be disproportionately affected by any trade embargoes, excise taxes or other restrictions imposed by their governments on trade with United States companies such as ourselves. Any restrictions of these types could result in a reduction in our sales to customers in these countries.

Political and economic instability. We are subject to various global risks related to political and economic instabilities in countries in which we derive sales. If terrorist activities, armed conflict, civil or military unrest or political instability occurs outside of the U.S., these events may result in reduced demand for our products. There is considerable political instability in Taiwan related to its disputes with China and in South Korea related to its disputes with North Korea. In addition, several Asian countries, particularly Japan, have experienced significant economic instability. An

12

Table of Contents

outbreak of hostilities or other political upheaval in China, Taiwan or South Korea, or an economic downturn in Japan or other countries, would likely harm the operations of our customers in these countries. The effect of these types of events on our revenues and cash flows could be material because we derive substantial revenues from sales to semiconductor device foundries in Taiwan such as Taiwan Semiconductor Manufacturing Company Ltd., from memory chip manufacturers in South Korea such as Samsung, and from semiconductor device manufacturers in Japan such as Toshiba.

Difficulties in staffing and managing foreign branch operations. During periods of tension between the governments of the United States and certain other countries, it is often difficult for United States companies such as ourselves to staff and manage operations in such countries. Language and other cultural differences may also inhibit our sales and marketing efforts and create internal communication problems among our U.S. and foreign research and development teams, increasing the difficulty of managing multiple, remote locations performing various development, quality assurance, and yield ramp analysis projects.

Currency fluctuations as compared to the U.S. Dollar. A substantial portion of our international sales are denominated in U.S. dollars. As a result, if the dollar rises in value in relation to foreign currencies, our systems will become more expensive to customers outside the United States and less competitive with systems produced by competitors outside the United States. These conditions could negatively impact our international sales. Foreign sales also expose us to collection risk in the event it becomes more expensive for our foreign customers to convert their local currencies into U.S. dollars. Additionally, in the event a larger portion of our revenue becomes denominated in foreign currencies, we would be subject to a potentially significant exchange rate risk.

If we deliver systems with defects, our credibility will be harmed and the sales and market acceptance of our systems will decrease

Our systems are complex and have occasionally contained errors, defects and bugs when introduced. Defects may be created during probing, bumping, dicing or general handling, and can have a major impact on device and process quality. When this occurs, our credibility and the market acceptance and sales of our systems could be harmed. Further, if our systems contain errors, defects or bugs, computer viruses or malicious code as a result of cyber attacks to our computer networks, we may be required to expend significant capital and resources to alleviate these problems. Defects could also lead to product liability as a result of product liability lawsuits against us or against our customers. We have agreed to indemnify our customers under certain circumstances against liability arising from defects in our systems. Our product liability policy currently provides $2.0 million of aggregate coverage, with an overall umbrella limit of $20.0 million. In the event of a successful product liability claim, we could be obligated to pay damages significantly in excess of our product liability insurance limits.

If we are not successful in developing new and enhanced products for the semiconductor device manufacturing industry, we will lose sales and market share to our competitors

We operate in an industry that is highly competitive and subject to evolving industry standards, rapid technological changes, rapid changes in consumer demands and the rapid introduction of new, higher performance systems with shorter product life cycles. To be competitive in our demanding market, we must continually design, develop and introduce in a timely manner new lithography, inspection and metrology process control systems that meet the performance and price demands of semiconductor device manufacturers. We must also continue to refine our current systems so that they remain competitive. We expect to continue to make significant investments in our research and development activities. We may experience difficulties or delays in our development efforts with respect to new systems, and we may not ultimately be successful in our product enhancement efforts to improve and advance products or in responding effectively to technological change, as not all research and development activities result in viable commercial products. In addition, we cannot provide assurance that we will be able to develop new products for the most opportunistic new markets and applications. Any significant delay in releasing new systems could cause our products to become obsolete, adversely affect our reputation, give a competitor a first-to-market advantage or cause a competitor to achieve greater market share. In addition, new product offerings that are highly complex in terms of software or hardware may require application or service work such as bug fixing prior to acceptance, thereby delaying revenue recognition.

13

Table of Contents

If new products developed by us do not gain general market acceptance, we will be unable to generate revenues and recover our research and development costs

Inspection, lithography and metrology product development is inherently risky because it is difficult to foresee developments in semiconductor device manufacturing technology, coordinate technical personnel, and identify and eliminate system design flaws. Further, our products are complex and often the applications to our customers' businesses are unique. Any new systems we introduce may not achieve or sustain a significant degree of market acceptance and sales.

We expect to spend a significant amount of time and resources developing new systems and refining our existing systems. In light of the long product development cycles inherent in our industry, these expenditures will be made well in advance of the prospect of deriving revenue from the sale of those systems. Our ability to commercially introduce and successfully market new systems are subject to a wide variety of challenges during the development cycle, including start-up bugs, design defects, and other matters that could delay introduction of these systems. In addition, since our customers are not obligated by long-term contracts to purchase our systems, our anticipated product orders may not materialize, or orders that are placed may be canceled. As a result, if we do not achieve market acceptance of new products, we may be unable to generate sufficient revenues and cash flows to recover our research and development costs and our market share, revenue, operating results or stock price would be negatively impacted.

Even if we are able to develop new products that gain market acceptance, sales of these new products could impair our ability to sell existing products

Competition from our new systems could have a negative effect on sales of our existing systems and the prices that we could charge for these systems. We may also divert sales and marketing resources from our current systems in order to successfully launch and promote our new or next generation systems. This diversion of resources could have a further negative effect on sales of our current systems and the value of inventory.

If our relationships with our large customers deteriorate, our product development activities could be adversely affected

The success of our product development efforts depends on our ability to anticipate market trends and the price, performance and functionality requirements of semiconductor device manufacturers. In order to anticipate these trends and ensure that critical development projects proceed in a coordinated manner, we must continue to collaborate closely with our largest customers. Our relationships with these and other customers provide us with access to valuable information regarding trends in the semiconductor device industry, which enables us to better plan our product development activities. If our current relationships with our large customers are impaired, or if we are unable to develop similar collaborative relationships with important customers in the future, our product development activities could be adversely affected.

Our ability to reduce costs is limited by our ongoing need to invest in research and development and to provide customer support activities

Our industry is characterized by the need for continual investment in research and development as well as customer service and support. As a result, our operating results could be materially affected if operating costs associated with our research and development as well as customer support activities increase in the future or we are unable to reduce those activities.

We may fail to adequately protect our intellectual property and, therefore, lose our competitive advantage

Our future success and competitive position depend in part upon our ability to obtain and maintain proprietary technology for our principal product families, and we rely, in part, on patent and trade secret law and confidentiality agreements to protect that technology. If we fail to adequately protect our intellectual property, it will give our competitors a significant advantage. We own or have licensed a number of patents relating to our transparent and opaque thin film metrology, lithography and macro-defect inspection systems, and have filed applications for additional patents. Any of our pending patent applications may be rejected, and we may be unable to develop additional proprietary technology that is patentable in the future.

14

Table of Contents

In addition, the patents that we do own or that have been issued or licensed to us may not provide us with competitive advantages and may be challenged by third parties. Further, third parties may also design around these patents. In addition to patent protection, we rely upon trade secret protection for our confidential and proprietary information and technology. We routinely enter into confidentiality agreements with our employees and other third parties. Even though these agreements are in place there can be no assurances that trade secrets and proprietary information will not be disclosed, that others will not independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets, or that we can fully protect our trade secrets and proprietary information. Violations by others of our confidentiality agreements and the loss of employees who have specialized knowledge and expertise could harm our competitive position and cause our sales and operating results to decline as a result of increased competition. Costly and time-consuming litigation might be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection might adversely affect our ability to continue our research or bring products to market.

Protection of our intellectual property rights, or the efforts of third parties to enforce their own intellectual property rights against us, may result in costly and time-consuming litigation, substantial damages, lost product sales and/or the loss of important intellectual property rights

We may be required to initiate litigation in order to enforce any patents issued to or licensed by us, or to determine the scope or validity of a third party's patent or other proprietary rights. Any litigation, regardless of outcome, could be expensive and time consuming, and could subject us to significant liabilities or require us to re-engineer our products or obtain expensive licenses from third parties. There can be no assurance that any patents issued to or licensed by us will not be challenged, invalidated or circumvented or that the rights granted thereunder will provide us with a competitive advantage.

In addition, our commercial success depends in part on our ability to avoid infringing or misappropriating patents or other proprietary rights owned by third parties. From time to time, we may receive communications from third parties asserting that our products or systems infringe, or may infringe, the proprietary rights of these third parties. These claims of infringement may lead to protracted and costly litigation, which could require us to pay substantial damages or have the sale of our products or systems stopped by an injunction. Infringement claims could also cause product or system delays or require us to redesign our products or systems, and these delays could result in the loss of substantial revenues. We may also be required to obtain a license from the third party or cease activities utilizing the third party's proprietary rights. We may not be able to enter into such a license or such a license may not be available on commercially reasonable terms. Accordingly, the loss of important intellectual property rights could hinder our ability to sell our systems, or make the sale of these systems more expensive. For additional information regarding recent patent litigation, see Item 3. ("Legal Proceedings").

Our efforts to protect our intellectual property may be less effective in certain foreign countries, where intellectual property rights are not as well protected as in the United States

The laws of some foreign countries do not protect our proprietary rights to as great an extent as do the laws of the United States, and many U.S. companies have encountered substantial problems in protecting their proprietary rights against infringement abroad. For example, Taiwan is not a signatory of the Patent Cooperation Treaty, which is designed to specify rules and methods for defending intellectual property internationally. The publication of a patent in Taiwan prior to the filing of a patent in Taiwan would invalidate the ability of a company to obtain a patent in Taiwan. Similarly, in contrast to the United States where the contents of patents remain confidential during the patent application process, in Taiwan the contents of a patent are published upon filing which provides competitors an advance view of the contents of a patent application prior to the establishment of patent rights. Consequently, there is a risk that we may be unable to adequately protect our proprietary rights in certain foreign countries. If this occurs, it would be easier for our competitors to develop and sell competing products in these countries.

Some of our current and potential competitors have significantly greater resources than we do, and increased competition could impair sales of our products or cause us to reduce our prices

The market for semiconductor capital equipment is highly competitive. We face substantial competition from established companies in each of the markets we serve. We principally compete with KLA-Tencor, Camtek and

Ultratech. We compete to a lesser extent with companies such as Nanometrics, Nova Measurement Instruments and Nikon. Each of our products also competes with products that use different metrology, inspection or lithography techniques. Some

Table of Contents

of our competitors have greater financial, engineering, manufacturing and marketing resources, broader product offerings and service capabilities and larger installed customer bases than we do. As a result, these competitors may be able to respond more quickly to new or emerging technologies or market developments by devoting greater resources to the development, promotion and sale of products, which, in turn, could impair sales of our products. Further, there may be significant merger and acquisition activity among our competitors and potential competitors, which, in turn, may provide them with a competitive advantage over us by enabling them to rapidly expand their product offerings and service capabilities to meet a broader range of customer needs.

Many of our customers and potential customers in the semiconductor device manufacturing industry are large companies that require global support and service for their semiconductor capital equipment. We believe that our global support and service infrastructure is sufficient to meet the needs of our customers and potential customers. However, some of our competitors have more extensive infrastructures than we do, which could place us at a disadvantage when competing for the business of global semiconductor device manufacturers. Many of our competitors are investing heavily in the development of new systems that will compete directly with our systems. We have from time to time selectively reduced prices on our systems in order to protect our market share, and competitive pressures may necessitate further price reductions. We expect our competitors in each product area to continue to improve the design and performance of their products and to introduce new products with competitive prices and performance characteristics. These product introductions would likely require us to decrease the prices of our systems and increase the level of discounts that we grant our customers. Price reductions or lost sales as a result of these competitive pressures would reduce our total revenues and could adversely impact our financial results.

Because of the high cost of switching equipment vendors in our markets, it is sometimes difficult for us to win customers from our competitors even if our systems are superior to theirs

We believe that once a semiconductor device manufacturer has selected one vendor’s capital equipment for a production-line application, the manufacturer generally relies upon that capital equipment and, to the extent possible, subsequent generations of the same vendor’s equipment, for the life of the application. Once a vendor’s equipment has been installed in a production line application, a semiconductor device manufacturer must often make substantial technical modifications and may experience production-line downtime in order to switch to another vendor’s equipment. Accordingly, unless our systems offer performance or cost advantages that outweigh a customer’s expense of switching to our systems, it will be difficult for us to achieve significant sales to that manufacturer once it has selected another vendor’s capital equipment for an application.

We must attract and retain experienced senior executives and other key personnel with knowledge of semiconductor device manufacturing and inspection, metrology or lithography equipment to help support our future growth, and competition for such personnel in our industry is high

Our success depends to a significant degree upon the continued contributions of our key executive management, engineering, sales and marketing, customer support, finance and manufacturing personnel. The loss of any of these key personnel through resignations, retirement or other circumstances, each of whom would be extremely difficult to replace, could harm our business and operating results. Although we have employment and noncompetition agreements with key members of our senior management team, these individuals or other key employees may still leave us, which could have a material adverse effect on our business. We do not have key person life insurance on any of our executives. In addition, to support our future growth, we will need to attract and retain additional qualified employees. Competition for such personnel in our industry is intense, and we may not be successful in attracting and retaining qualified employees.

We obtain some of the components and subassemblies included in our systems from a limited group of suppliers, and the partial or complete loss of one of these suppliers could cause production delays and a substantial loss of revenues

We obtain some of the components and subassemblies included in our systems from a limited group of suppliers and do not have long-term contracts with many of our suppliers. Our dependence on limited source suppliers of components and our lack of long-term contracts with many of our suppliers exposes us to several risks, including a potential inability to obtain an adequate supply of components, price increases, late deliveries and poor component quality. Disruption or termination of the supply of these components could delay shipments of our systems, damage

our customer relationships and reduce our sales. From time to time in the past, we have experienced temporary difficulties in receiving shipments from our suppliers. The lead-time required for shipments of some of our components can be as

Table of Contents

long as six months. In addition, the lead time required to qualify new suppliers for lasers and certain optics could be as long as a year, and the lead time required to qualify new suppliers of other components could be as long as nine months. If we are unable to accurately predict our component needs, or if our component supply is disrupted, we may miss market opportunities by not being able to meet the demand for our systems. Further, a significant increase in the price of one or more of these components or subassemblies could seriously harm our results of operations and cash flows.

Any prolonged disruption in the operations of our manufacturing facility could have a material adverse effect on our revenues

Our manufacturing processes are highly complex and require sophisticated and costly equipment and a specially designed facility. As a result, any prolonged disruption in the operations of our manufacturing facility, whether due to technical or labor difficulties, or destruction of or damage as a result of a fire or any other reason, could seriously harm our ability to satisfy our customer order deadlines. If we cannot timely deliver our systems, our results from operations and cash flows could be materially and adversely affected.

Our business is subject to cybersecurity risks

Threats to information technology systems associated with cybersecurity risks and cyber incidents or attacks continue to grow. Cybersecurity attacks could include, but are not limited to, malicious software, viruses, attempts to gain unauthorized access, whether through malfeasance or error, either from within or outside of our organization, to our data or that of our customers or our customers' customers which may be in our possession, and the unauthorized release, corruption or loss of the data, loss of the intellectual property, theft of the proprietary or licensed technology, whether ours, that of our customers or their customers, loss or damage to our data delivery systems, other electronic security breaches that could lead to disruptions in our critical systems, and increased costs to prevent, respond to or mitigate cybersecurity events. It is possible that our business, financial and other systems could be compromised, which might not be noticed for some period of time. Although we utilize various procedures and controls to mitigate our exposure to such risk, cybersecurity attacks are evolving and unpredictable and we cannot guarantee that any risk prevention measures implemented will be successful. The occurrence of such an attack could lead to financial losses and have a material adverse effect on our reputation, business, financial condition and results of operations.

Failure to adjust our orders for parts and subcomponents in an accurate and timely manner in response to changing market conditions or customer acceptance of our products could adversely affect our financial position and results of operations

Our earnings could be negatively affected and our inventory levels could materially increase if we are unable to predict our inventory needs in an accurate and timely manner and adjust our orders for parts and subcomponents should our needs increase or decrease materially due to unexpected increases or decreases in demand for our products. Any material increase in our inventories could result in an adverse effect on our financial position, while any material decrease in our ability to procure needed inventories could result in an inability to supply customer demand for our products, thus adversely affecting our revenues.

Our ability to fulfill our backlog may have an effect on our long term ability to procure contracts and fulfill current contracts

Our ability to fulfill our backlog may be limited by our ability to devote sufficient financial and human capital resources and limited by available material supplies. If we do not fulfill our backlog in a timely manner, we may experience delays in product delivery which would postpone receipt of revenue from those delayed deliveries. Additionally, if we are consistently unable to fulfill our backlog, this may be a disincentive to customers to award large contracts to us in the future until they are comfortable that we can effectively manage our backlog.

We may choose to acquire new and complementary businesses, products or technologies instead of developing them ourselves, and may be unable to complete these acquisitions or may not be able to successfully integrate an acquired business in a cost-effective and non-disruptive manner

Our success depends on our ability to continually enhance and broaden our product offerings in response to changing technologies, customer demands and competitive pressures. To this end, we have, from time to time, engaged

17

Table of Contents

in the process of identifying, analyzing and negotiating possible acquisition transactions, and from time to time acquiring one or more businesses, and we expect to continue to do so in the future. We may choose to acquire new and complementary businesses, products, technologies and/or services instead of developing them ourselves. We may, however, face competition for acquisition targets from larger and more established companies with greater financial resources, making it more difficult for us to complete acquisitions. We cannot provide any assurance that we will be successful in consummating future acquisitions on favorable terms or that we will realize the benefits that we anticipate from one or more acquisitions that we consummate. Integrating any business, product technology or service we acquire could be expensive and time-consuming and/or disrupt our ongoing business. Further, there are numerous risks associated with acquisitions and potential acquisitions, including but not limited to:

- diversion of management's attention from day-to-day operational matters and current products and customers;
- lack of synergy, or the inability to successfully integrate the new business or to realize expected synergies;
- failure to commercialize the new technology or business;
- failure to meet the expected performance of the new technology or business;
- failure to retain key employees and customer or supplier relationships;
- lower-than-expected market opportunities or market acceptance of any new products; and
- unexpected reduction of sales of existing products by new products.

Our inability to consummate one or more acquisitions on such favorable terms or our failure to realize the intended benefits from one or more acquisitions, could have a material adverse effect on our business, liquidity, financial position and/or results of operations, including as a result of our incurrence of indebtedness and related interest expense and our assumption of unforeseen contingent liabilities. In order to finance any acquisitions, we might need to raise additional funds through public or private equity or debt financings. In that event, we could be forced to obtain financing on terms that are not favorable to us and, in the case of equity financing, that result in dilution to our stockholders. In addition, any impairment of goodwill or other intangible assets, amortization of intangible assets, write-down of other assets or charges resulting from the costs of acquisitions and purchase accounting could harm our business and operating results.

If we cannot effectively manage growth, our business may suffer

Over the long-term, we intend to grow our business by increasing our sales efforts and completing strategic acquisitions. To effectively manage growth, we must, among other things:

- engage, train and manage a larger sales force and additional service personnel;
- expand the geographic coverage of our sales force;
- expand our information systems;
- identify and successfully integrate acquired businesses into our operations; and
- administer appropriate financial and administrative control procedures.

Growth of our business will likely place a significant strain on our management, financial, operational, technical, sales and administrative resources. Any failure to effectively manage our growth may cause our business to suffer and our stock price to decline.

Changes in tax rates or tax liabilities could affect results

As a global company, we are subject to taxation in the United States and various other countries. Significant judgment is required to determine and estimate worldwide tax liabilities. Our future annual and quarterly tax rates could be affected by numerous factors, including changes in the (1) applicable tax laws; (2) composition of earnings in countries with differing tax rates; or (3) recoverability of our deferred tax assets and liabilities. In addition, we are subject to regular examination of our income tax returns by the Internal Revenue Service and other tax authorities. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. Although we believe our tax estimates are reasonable, there can be no

Table of Contents

assurance that any final determination will not be materially different from the treatment reflected in our historical income tax provisions and accruals, which could materially and adversely affect our results of operations.

The Organization for Economic Co-operation and Development, or OECD, released guidance covering various topics, including country-by-country reporting, definitional changes to permanent establishment and Base Erosion and Profit Shifting, or BEPS, an initiative that aims to standardize and modernize global tax policy. Depending on the final form of guidance adopted by OECD members and legislation ultimately enacted, if any, there may be significant consequences for us due to our international business activities.

Turmoil or fluctuations in the credit markets and the financial services industry may negatively impact our business, results of operations, financial condition or liquidity

During recent years, global credit markets and the financial services industry have experienced a period of unprecedented turmoil and upheaval characterized by tightening of the credit markets, weakening of the global economy and an unprecedented level of intervention from the United States and other governments. Adverse economic conditions, such as sustained periods of economic uncertainty or a crisis in the financial markets may have a material adverse effect on our liquidity and financial condition if our ability to obtain credit from the capital financial markets or from trade creditors were to be impaired. In addition, a worsening economy or an economic crisis could also adversely impact our customers' ability to finance the purchase of systems from us or our suppliers' ability to provide us with product, either of which may negatively impact our business and results of operations.

Regulations related to "conflict minerals" may force us to incur additional expenses, may make our supply chain more complex and may result in damage to our reputation with customers

On August 22, 2012, under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, or the Dodd-Frank Act, the SEC adopted requirements for companies that use certain minerals and metals, known as conflict minerals, in their products, whether or not these products are manufactured by third parties. These regulations require companies to perform due diligence, disclose and report whether or not such minerals originate from the Democratic Republic of Congo and adjoining countries. Our most recent such report was filed with the SEC on May 27, 2015. These regulations could adversely affect the sourcing, availability and pricing of minerals used in the manufacture of semiconductor devices, including our products. In addition, we have incurred and will continue to incur additional costs to comply with the disclosure requirements, including costs related to determining the source of any of the relevant minerals and metals used in our products. Since our supply chain is complex, we may not be able to sufficiently verify the origins for these minerals and metals used in our products through the due diligence procedures that we implement, which may harm our reputation. In such event, we may also face difficulties in satisfying customers who require that all of the components of our products are certified as conflict mineral free.

Risks Related to the Semiconductor Industry

Cyclicality in the semiconductor device industry has led to substantial decreases in demand for our systems and may from time to time continue to do so

Our operating results are subject to significant variation due to the cyclical nature of the semiconductor device industry. Our business depends upon the capital expenditures of semiconductor device manufacturers, which, in turn, depend upon the current and anticipated market demand for semiconductors and products using semiconductors. The timing, length and severity of the up-and-down cycles in the semiconductor equipment industry are difficult to predict. In recent years, the industry has experienced significant downturns, generally in connection with declines in economic conditions. This cyclical nature of the industry in which we operate affects our ability to accurately predict future revenue and, thus, future expense levels. When cyclical fluctuations result in lower than expected revenue levels, operating results may be adversely affected and cost reduction measures may be necessary in order for us to remain competitive and financially sound. During a down cycle, we must be in a position to adjust our cost and expense structure to prevailing market conditions and to continue to motivate and retain our key employees. In addition, during periods of rapid growth, we must be able to increase manufacturing capacity and personnel to meet customer demand. We can provide no assurance that these objectives can be met in a timely manner in response to industry cycles. If we

fail to respond to industry cycles, our business could be seriously harmed.

Table of Contents

Our future rate of growth is highly dependent on the development and growth of the market for microelectronic device inspection, lithography and metrology equipment

We target our products to address the needs of microelectronic device manufacturers for defect inspection, metrology and lithography. If for any reason the market for microelectronic device inspection, lithography or metrology equipment fails to grow in the long term, we may be unable to maintain current revenue levels in the short term and maintain our historical growth in the long term. Growth in the inspection market is dependent to a large extent upon microelectronic manufacturers replacing manual inspection with automated inspection technology. Growth in the metrology market is dependent to a large extent upon new chip designs and capacity expansion of microelectronic manufacturers. Growth in the lithography market is dependent on the development of cost-effective packaging with high fine pitch redistribution layers (RDL), ultimately migrating to multi-die, large, form-factor packages. There is no assurance that manufacturers will undertake these actions at the rate we expect.

Risks Related to our Stock

Provisions of our charter documents and Delaware law could discourage potential acquisition proposals and/or delay, deter or prevent a change in control of our company

Provisions of our certificate of incorporation and bylaws may inhibit changes in control of our company not approved by our Board of Directors. These provisions also limit the circumstances in which a premium can be paid for the common stock, and in which a proxy contest for control of our board may be initiated. These provisions provide for:

- a prohibition on stockholder actions through written consent;
- a requirement that special meetings of stockholders be called only by our chief executive officer or Board of Directors;
- advance notice requirements for stockholder proposals and director nominations by stockholders;
- limitations on the ability of stockholders to amend, alter or repeal our by-laws;
- the authority of our board to issue, without stockholder approval, preferred stock with such terms as the board may determine; and
- the authority of our board, without stockholder approval, to adopt a stockholder rights plan. Such a stockholder rights plan was adopted by the Board of Directors on June 27, 2005 and expired on June 28, 2015.

We are also entitled to avail ourselves of the protections of Section 203 of the Delaware General Corporation Law, which could inhibit changes in control of us.

Our stock price is volatile

The market price of our common stock has fluctuated widely. From the beginning of 2012 through the end of 2016, our stock price fluctuated between a high of $24.45 per share and a low of $8.09 per share. Consequently, the current market price of our common stock may not be indicative of future market prices, and we may be unable to sustain or increase the value of an investment in our common stock. Factors affecting our stock price may include:

- variations in operating results from quarter to quarter;
- changes in earnings estimates by analysts or our failure to meet analysts' expectations;
- changes in the market price per share of our public company customers;
- market conditions in the semiconductor and other industries into which we sell products;
- general economic conditions;
- political changes, hostilities or natural disasters such as hurricanes and floods;
- low trading volume of our common stock; and
- the number of firms making a market in our common stock.

Table of Contents

In addition, the stock market has experienced periods of significant price and volume fluctuations. These fluctuations have particularly affected the market prices of the securities of high technology companies like ours. Any such market fluctuations in the future could adversely affect the market price of our common stock.

There are various risks related to the legal and regulatory environments in which we perform our operations and conduct our business that may expose us to risk

We are faced with various risks which may be associated with our compliance with existing, new, different, inconsistent or conflicting laws, regulations and rules enacted by governments and/or their regulatory agencies in the countries in which we operate as well as rules and policies implemented at our customer sites. These laws, regulations, rules and policies could relate to any of an array of issues including, but not limited to, environmental, tax, intellectual property, trade secrets, product liability, contracts, antitrust, employment, securities, import/export and unfair competition. Should we fail to comply with or violate U.S. or foreign laws or regulations or customer policies, we could be subject to civil or criminal claims or proceedings that may result in monetary fines, penalties or other costs against us or our employees that may adversely affect our operating results, financial condition, customer relations and ability to conduct our business.

Item 1B. Unresolved Staff Comments.

None.

Table of Contents

Item 2. Properties.

Our principal executive office building is located at 16 Jonspin Road in Wilmington, Massachusetts. We own and lease facilities for corporate, engineering, manufacturing, sales and service related purposes in the United States and six other countries — China, Japan, South Korea, Singapore, Taiwan and Scotland. The following table indicates the location, the general purpose and the square footage of our principal facilities. The expiration years of the leases covering the leased facilities are also indicated.

Location	Facility Purpose	Approximate Square Footage	Lease Expiration Year, Unless Owned
Budd Lake, New Jersey	Corporate, Engineering and Service	49,000	2023
Bloomington, Minnesota	Engineering, Manufacturing and Service	98,500	2019
Tewksbury, Massachusetts	Engineering and Service	7,000	2017
Wilmington, Massachusetts	Corporate, Engineering, Manufacturing and Service	43,000	2019
Richardson, Texas	Engineering	21,000	Owned
Bohemia, New York	Engineering	6,000	2019
Snoqualmie, Washington	Engineering and Service	27,000	2020
Newbury Park, California	Engineering and Service	3,000	2017
Tianjin, China	Engineering	5,000	2017
Hsin-Chu, Taiwan	Sales and Service	10,500	2017
Takatsu, Japan	Sales and Service	3,500	2017
Sungnam-si, South Korea	Sales and Service	9,000	2017
Shanghai, China	Sales and Service	2,500	2019
Singapore	Sales and Service	2,500	2019
Scotland, United Kingdom	Sales and Service	1,000	2018

We also lease office space for other smaller sales and service offices in several locations throughout the world.

We believe that our existing facilities and capital equipment are adequate to meet our current requirements, and that suitable additional or substitute space is available on commercially reasonable terms if needed.

Item 3. Legal Proceedings.

From time to time, we are subject to legal proceedings and claims in the ordinary course of business. The following reflects an overview of the material activities with regard to these matters.

Integrated Technology Corporation v. Rudolph Technologies, Inc., No. CV-06-2182 (PHX-ROS): The sole remaining issue in this case was the determination and payment of remanded attorney's fees which were initially set by the U.S. District Court for the District of Arizona (the "AZ District Court") at $3.3 million. Subsequent to our successful appeal before the U.S. Federal Court of Appeals, the matter was remanded back to the AZ District Court for a determination of a proper fee award. On October 5, 2016, the AZ District Court issued an order determining that we are to pay $1.3 million to ITC for its attorney's fees. The payment was made in November of 2016 and this matter is now closed.

August Technology Corporation and Rudolph Technologies, Inc. v. Camtek, Ltd., No. 05-CV-01396 (JRT/FLN): Subsequent to the ruling by the U.S. District Court for the District of Minnesota (the "MN District Court") in our favor that Camtek's Falcon tools continue to infringe our patent under the revised claim construction of the patent determined by the Court of Appeals, the MN District Court, on February 9, 2015, issued an Order granting our Motion for Final Judgment, reinstating the original damages and applying prejudgment interest for a total award of $14.5 million. In addition, the MN District Court issued a permanent injunction against Camtek from "making, using, selling

and offering to sell any of its Falcon machines and any machines that are colorable imitations thereof in the United States, intended for sale and use within the United States, until the expiration of the ‘6,298 patent,” which is projected to be in 2020.

Table of Contents

While, in March of 2015, Camtek filed an appeal with the Court of Appeals challenging the MN District Court's ruling, the Court of Appeals denied Camtek's appeal on February 3, 2016, affirming both the infringement ruling and the damages and interest totaling approximately $14.6 million assessed against Camtek by the MN District Court, the payment of which is guaranteed by a supersedeas bond. All of Camtek's rights to appeal the final judgment have expired. On July 22, 2016, the MN District Court ordered that the full amount of the judgment be paid to us. With the payment of the final judgment amount on August 11, 2016, this matter has been closed.

August Technology Corporation and Rudolph Technologies, Inc. v. Camtek, Ltd., No. 11-CV-03707 (MJD/TNL): A lawsuit against Camtek, Ltd., of Migdal Hamek, Israel, was filed by us in 2011 alleging infringement of its U.S. Patent No. 7,729,528 related to our proprietary continuous scan wafer inspection technology. Camtek filed an inter partes reexamination petition with the U.S. Patent and Trademark Office (the "PTO") on January 19, 2012 asserting that certain claims of the patent are unpatentable. In the course of this proceeding the PTO issued a final determination that 35 claims of the patent were valid and 18 claims were rejected. We appealed the PTO's rejection of the 18 claims to the US. Court of Appeals. On December 22, 2016, the U.S. Court of Appeals for the Federal Circuit reversed the PTO's rejection of three of the 18 patent claims and affirmed the PTO's rejection of nine of the 18 patent claims. The appeal of the remaining six patent claims was dismissed for procedural reasons. Thus, 38 claims are available to be asserted under the '528 patent in this lawsuit. During the pendency of the reexamination process, the parties have stipulated that the lawsuit be stayed. With resolution of Camtek's petition, it is intended to lift the stay in the lawsuit in Q1 2017.

Rudolph Technologies, Inc. v. Camtek, Ltd., No. 15-CV-1246 (ADM/BRT): On March 12, 2015, we filed and served on Camtek a complaint asserting infringement of Rudolph's U.S. Patent No. 6,826,298 by Camtek's Eagle product with the U.S. District Court in Minnesota. The '6,298 patent is also related to our proprietary continuous scan wafer inspection technology and was the subject of Rudolph's prior litigation against the Camtek Falcon system (the "Falcon Litigation") in which Rudolph prevailed with a final judgment of infringement and damages of $14.6 million assessed against Camtek. On April 21, 2015, we filed a Motion for Preliminary Injunction to enjoin Camtek's sale of the Eagle device in the United States. On or about April 20, 2015, Camtek filed a complaint in the U.S. District Court in New Jersey seeking a declaratory judgment challenging the jurisdiction and venue of the Minnesota District Court and seeking to have the New Jersey District Court find that the '6,298 patent is not infringed and, in the alternative, that the '6,298 patent is invalid. On August 26, 2015, the U.S. District Court in Minnesota ruled that Minnesota jurisdiction was appropriate for this matter while at the same time denying our Motion for Preliminary Injunction. Camtek's complaint filed in the U.S. District Court in New Jersey was subsequently dismissed. On August 8, 2016 the Minnesota District Court issued an order regarding motions for partial summary judgment which we had filed in March of 2016 granting (i) that the '6,298 patent is valid and Camtek is precluded from contesting its validity at trial, and (ii) that the claim constructions adopted in the Falcon Litigation for four terms are entitled to a preclusive effect and will apply in the course of the present litigation. The Minnesota District Court also ruled that three phrases not subject to claim construction in the Falcon Litigation may be defined in the present case. This matter is currently ongoing in the U.S. District Court in Minnesota with no trial date set.

Item 4. Mine Safety Disclosures.

None.

Table of Contents

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Our common stock is traded on the New York Stock Exchange ("NYSE") under the symbol "RTEC." Set forth below is a line graph comparing the annual percentage change in the cumulative return to the stockholders of the Company's common stock with the cumulative return of the NYSE Composite Index, the Research Data Group (RDG) Semiconductor Components Composite Index and a custom peer group for the period commencing on December 31, 2011 and ending on December 31, 2016. The peer group is comprised of capital equipment manufacturers for the semiconductor industry with relatively comparable revenues and market capitalizations to that of the Company. The peer group was recommended by a global management consulting firm. The companies included in the peer group are Advanced Energy Industries, Inc., Axcelis Technologies, Inc., AXT, Inc., Brooks Automation, Inc., Cabot Microelectronics Corporation, Cohu, Inc., EMCORE Corporation, FormFactor, Inc., MKS Instruments, Inc., Nanometrics, Incorporated, PDF Solutions, Inc., Ultratech, Inc., Veeco Instruments, Inc. and Xcerra Corporation. FEI Company and Mattson Technology, Inc. were each acquired in 2016 and are excluded from the peer group for 2016 and retroactively.

The information contained in the performance graph shall not be deemed to be "soliciting material" or to be "filed" with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or the Securities Exchange Act of 1934, except to the extent that the Company specifically incorporates it by reference into such filing.

The graph assumes that $100 was invested on December 31, 2011 in the Company's common stock in each index, and that all dividends were reinvested. No cash dividends have been declared or paid on the Company's common stock. Stockholder returns over the indicated period should not be considered indicative of future stockholder returns.

	12/11	12/12	12/13	12/14	12/15	12/16
Rudolph Technologies, Inc.	100.0	145.1	126.8	110.5	153.6	252.2
NYSE Composite	100.0	116.0	146.5	156.4	150.0	167.9
RDG Semiconductor Composite	100.0	101.6	137.3	170.9	153.1	206.3
Peer Group	100.0	111.4	136.5	141.4	128.9	203.8

Table of Contents

The following table sets forth, for the periods indicated, the high and low sale prices per share of our common stock as reported on the NYSE.

	Price Range of Common Stock	
	High	Low
Year Ended December 31, 2016		
First Quarter	$14.01	$11.17
Second Quarter	$15.69	$12.84
Third Quarter	$18.00	$15.04
Fourth Quarter	$24.45	$16.80
Year Ended December 31, 2015		
First Quarter	$12.77	$9.71
Second Quarter	$13.84	$10.91
Third Quarter	$13.65	$10.71
Fourth Quarter	$15.06	$11.91

As of January 25, 2017, there were 62 stockholders of record of our common stock and approximately 6,762 beneficial stockholders. The closing market value of our common stock on January 25, 2017 was $23.40 per share.
We have never declared or paid a cash dividend on our common stock and currently do not anticipate paying any cash dividends in the foreseeable future. We currently intend to retain our earnings, if any, for the development of our business and the share repurchase of our common stock. The declaration of any future dividends by us is within the discretion of our Board of Directors and will be dependent on our earnings, financial condition and capital requirements as well as any other factors deemed relevant by our Board of Directors.
In January 2015, the Board of Directors authorized the Company to repurchase up to 3.0 million shares of the Company’s common stock with no established end date. The authorization allows for repurchases to be made in the open market or through negotiated transactions from time to time. During the twelve months ended December 31, 2016, we repurchased 615 thousand shares of common stock. At December 31, 2016, there were 711 thousand shares available for future stock repurchases under this repurchase authorization. Shares of common stock purchased under the share repurchase authorization are retired. For further information, see Note 15 in the accompanying consolidated financial statements.
In addition to the our share repurchase program, we withhold common stock shares associated with net share settlements to cover tax withholding obligations upon the vesting of restricted stock unit awards and stock option exercises under the Company’s equity incentive program. During the three and twelve months ended December 31, 2016, we withheld 1 thousand and 123 thousand shares through net share settlements, respectively. For the three and twelve month periods ended December 31, 2016 net share settlements cost fifteen thousand and $1.6 million, respectively. Please refer to Note 9 of the Notes to Consolidated Financial Statements for further discussion regarding our equity incentive plan.
The following table provides details of common stock purchased during the three month period ended December 31, 2016 (in thousands, except per share data):

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced	Maximum Number of Shares that May Yet Be Purchased Under the

			Program	Program
October 1, 2016 to October 31, 2016	1	$ 17.74	—	711
November 1, 2016 to November 30, 2016	—	$ —	—	711
December 1, 2016 to December 31, 2016	—	$ —	—	711
Three Months Ended December 31, 2016	1	$ 17.74	—	711

Table of Contents

Item 6. Selected Financial Data.

The following selected financial data should be read in conjunction with our Consolidated Financial Statements and the related Notes thereto appearing elsewhere in this Annual Report on Form 10-K, and under Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” The balance sheet data as of December 31, 2016 and 2015 and the statement of operations data for the years ended December 31, 2016, 2015 and 2014 set forth below were derived from our audited consolidated financial statements included elsewhere in this Form 10-K. The balance sheet data as of 2014, 2013 and 2012, and the statement of operations data for the years ended December 31, 2013 and 2012 were derived from our audited consolidated financial statements not included herein.

	Year Ended December 31,				
	2016	2015	2014	2013	2012
	(In thousands, except per share data)				
Statement of Operations Data:					
Revenues	$232,780	$221,690	$181,218	$176,238	$218,486
Cost of revenues	109,229	102,284	85,730	85,506	102,811
Gross profit	123,551	119,406	95,488	90,732	115,675
Operating expenses:					
Research and development	44,964	41,233	40,576	39,994	39,331
Selling, general and administrative	38,562	43,235	53,799	41,542	40,225
Amortization	2,320	2,145	2,422	2,592	1,853
Patent litigation judgment	(14,643)	—	—	—	—
Total operating expenses	71,203	86,613	96,797	84,128	81,409
Operating income (loss)	52,348	32,793	(1,309)	6,604	34,266
Interest expense	2,834	5,688	5,317	5,079	4,377
Other (income) expense	(354)	293	65	(8)	482
Income (loss) before provision (benefit) for income taxes	49,868	26,812	(6,691)	1,533	29,407
Provision (benefit) for income taxes	12,916	8,856	(2,051)	(1,925)	(14,458)
Net income (loss)	$36,952	$17,956	$(4,640)	$3,458	$43,865
Earnings (loss) per share:					
Basic	$1.19	$0.57	$(0.14)	$0.11	$1.36
Diluted	$1.16	$0.56	$(0.14)	$0.10	$1.34
Weighted average shares outstanding:					
Basic	31,128	31,408	33,124	32,783	32,226
Diluted	31,790	32,166	33,124	33,388	32,853

Table of Contents

	December 31,				
	2016	2015 (1)	2014 (1)(2)(3)	2013 (1)(2)(3)	2012 (1)(3)
Balance Sheet Data:					
Cash and cash equivalents	$37,859	$44,554	$43,114	$80,790	$104,253
Marketable securities	87,872	116,924	113,871	86,582	64,963
Working capital	226,668	197,266	245,707	257,536	253,004
Total assets	338,699	379,563	365,944	370,306	363,225
Convertible senior notes	—	57,846	54,080	50,695	47,651
Accumulated deficit	(84,706)	(121,658)	(139,614)	(134,974)	(138,432)
Total stockholders' equity	293,735	270,678	267,328	279,003	270,489

(1) Effective in the first quarter of 2016, the Company adopted Accounting Standards Update (ASU) No. 2015-03, "Interest - Imputation of Interest (Subtopic 835-30), Simplifying the Presentation of Debt Issuance Costs," which requires entities to present debt issuance costs related to a debt liability as a direct deduction from the carrying amount of that debt liability on the balance sheet as opposed to being presented as a deferred charge. Prior to adoption, the Company reported the unamortized debt issuance costs in "Other Assets" on the Consolidated Balance Sheets.
(2) Effective December 31, 2015, we early adopted provisions prescribed by the Financial Account Standards Board (FASB) in Accounting Standards Update (ASU) No. 2015-17, "Income Taxes (Topic 740), Balance Sheet Classification of Deferred Taxes." Consequently, we reclassified net current deferred income tax assets to net long term deferred income tax assets for each period presented.
(3) Working capital data for 2012 through 2014 reflect reclassifications of a portion of deferred revenue to other non-current liabilities.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

Overview
We are a worldwide leader in the design, development, manufacture and support of process control defect inspection and metrology, advanced packaging lithography, and data analysis systems and software used by microelectronic device manufacturers. We provide process and yield management solutions used in both wafer processing and final manufacturing through a family of standalone systems for macro-defect inspection, lithography, probe card test and analysis, and transparent and opaque thin film measurements. All of our systems feature sophisticated software and production-worthy automation. Our systems are backed by worldwide customer service and applications support.
Rudolph's business is affected by the annual spending patterns of our customers on semiconductor capital equipment. The amount that our customers devote to capital equipment spending depends on a number of factors, including general worldwide economic conditions as well as other economic drivers such as personal computer, tablet, cell phone, other personal electronic devices and automotive sales. Current forecasts by industry analysts for the semiconductor device manufacturing industry projects a year-over-year increase in capital equipment spending of approximately 4%-8% for 2017. Our revenues and profitability tend to follow the trends of certain segments within the semiconductor market. We monitor capital equipment spending through announced capital spending plans by our customers and monthly-published industry data such as the book-to-bill ratio. The book-to-bill ratio is a 3-month running statistic that compares bookings or orders placed with capital equipment suppliers to billings or shipments. A book-to-bill ratio above 1.0 shows that semiconductor device equipment manufacturers are ordering equipment at a pace that exceeds the equipment suppliers' shipments for the period. The three month rolling average North American semiconductor equipment book-to-bill ratio was 1.1 for the month of December 2016, unchanged from the September 2016 book-to-bill ratio of 1.1.
Historically, a significant portion of our revenues in each quarter and year has been derived from sales to relatively few customers, and we expect this trend to continue. For the years ended December 31, 2016, 2015 and 2014, sales to customers that individually represented at least five percent of our revenues accounted for 34.5%, 23.3%, and 23.9%

of our revenues, respectively.

Table of Contents

We do not have purchase contracts with any of our customers that obligate them to continue to purchase our products, and they could cease purchasing products from us at any time. A delay in purchase or cancellation by any of our large customers could cause quarterly revenues to vary significantly. In addition, during a given quarter, a significant portion of our revenues may be derived from the sale of a relatively small number of systems. The following table presents the average selling price range for our systems in 2016.

System	Average Selling Price Per System
Process Control	$250,000 to $1.8 million
Lithography steppers	$3.0 million to $8.0 million

A significant portion of our revenues has been derived from customers outside of the United States. A substantial portion of our international sales are denominated in U.S dollars. We expect that revenues generated from customers outside of the United States will continue to account for a significant percentage of our revenues.

The sales cycle for our systems typically ranges from six to twenty-four months, and can be longer when our customers are evaluating new technology. Due to the length of these cycles, we invest significantly in research and development and sales and marketing in advance of generating revenues related to these investments.

Results of Operations

The following table sets forth, for the periods indicated, our statements of operations data as percentages of our revenues. Our results of operations are reported as one business segment.

	Year Ended December 31,		
	2016	2015	2014
Revenues	100.0 %	100.0%	100.0 %
Cost of revenues	46.9	46.1	47.3
Gross profit	53.1	53.9	52.7
Operating expenses:			
Research and development	19.3	18.6	22.4
Selling, general and administrative	16.6	19.5	29.7
Amortization	1.0	1.0	1.3
Patent litigation judgment	(6.3)	—	—
Total operating expenses	30.6	39.1	53.4
Operating income (loss)	22.5	14.8	(0.7)
Interest expense, net	1.2	2.6	2.9
Other (income) expense	(0.2)	0.1	0.1
Income (loss) before income taxes	21.5	12.1	(3.7)
Provision (benefit) for income taxes	5.6	4.0	(1.1)
Net income (loss)	15.9 %	8.1 %	(2.6)%

Table of Contents

Results of Operations 2016, 2015 and 2014

Revenues. Our revenues are derived from the sale of our systems, services, spare parts and software licensing. Our revenues were $232.8 million, $221.7 million and $181.2 million for the years ended December 31, 2016, 2015 and 2014, respectively. This represents an increase of 5.0% from 2015 to 2016 and an increase of 22.3% from 2014 to 2015. The increase in revenue from 2015 to 2016 was primarily due to increased capital spending by both the front-end and back-end semiconductor manufacturers, principally by our advanced packaging customers in the outsourced assembly and test market. The increase in revenue from 2014 to 2015 was primarily due to increased capital spending by both the front-end and back-end semiconductor manufacturers, principally by our advanced packaging customers, partially offset by a decline in service revenue.

The following table lists, for the periods indicated, the different sources of our revenues in dollars (thousands) and as percentages of our total revenues:

	Year Ended December 31,								
	2016			2015			2014		
Systems and software:									
Process Control	$146,652	63	%	$144,858	66	%	$112,408	63	%
Lithography	18,949	8	%	14,519	6	%	11,163	6	%
Software	29,795	13	%	27,291	12	%	24,042	13	%
Parts	25,343	11	%	24,072	11	%	20,334	11	%
Services	12,041	5	%	10,950	5	%	13,271	7	%
Total revenue	$232,780	100	%	$221,690	100	%	$181,218	100	%

Total systems and software revenue increased for the year ended December 31, 2016 as compared to the year ended December 31, 2015 due to increased demand for our products in both front-end and back-end systems. The year-over-year increases in process control, lithography and software systems revenue totaled $1.8 million, $4.4 million and $2.5 million, respectively. The increase in systems revenue was attributed to a greater number of process control and lithography units sold. The average selling price of similarly configured systems has been consistent and therefore did not have a material impact on our revenue for the same period. Systems revenue generated by our latest product releases and major enhancements in each of our product families amounted to 72% of total revenue for 2016 compared to 66% of total revenue for 2015. The year-over-year increase in parts and service revenues in absolute dollars from 2015 to 2016 was primarily due to increased spending by our customers on repairs of existing systems. Parts and services revenues are generated from part sales, maintenance service contracts, system upgrades, as well as time and material billable service calls.

Total systems and software revenue increased for the year ended December 31, 2015 as compared to the year ended December 31, 2014 due to increased demand for our products in advanced packaging and front-end systems. The year-over-year increases in process control and lithography systems revenue totaled $32.4 million and $3.4 million, respectively. The increase in systems revenue was attributed to a greater number of process control and lithography units sold. The average selling price of similarly configured systems has been consistent and therefore did not have a material impact on our revenue for the same period. Licensing revenue from the software product category increased $3.2 million primarily due to increased licensing revenue from our process control software. Systems revenue generated by our latest product releases and major enhancements in each of our product families amounted to 66% of total revenue for 2015 compared to 61% of total revenue for 2014. The year-over-year increase in parts and service revenues in absolute dollars from 2014 to 2015 was primarily due to increased spending by our customers on repairs of existing systems. Parts and services revenues are generated from part sales, maintenance service contracts, system upgrades, as well as time and material billable service calls.

Deferred revenues of $7.3 million were recorded in Current liabilities and $1.1 million were recorded in Other non-current liabilities at December 31, 2016. Deferred revenue primarily consisted of $6.1 million for deferred maintenance agreements and $2.3 million for outstanding deliverables. At December 31, 2015, deferred revenues of $6.4 million were recorded in Current liabilities and $1.2 million were recorded in Other non-current liabilities.

Deferred

29

Table of Contents

maintenance agreements of $5.2 million and outstanding deliverables of $2.4 million were the two main components of the December 31, 2015 balance.

Gross Profit. Our gross profit has been and will continue to be affected by a variety of factors, including manufacturing efficiencies, provision for excess and obsolete inventory, pricing by competitors or suppliers, new product introductions, production volume, customization and reconfiguration of systems, international and domestic sales mix, system and software product mix, and parts and service margins. Our gross profit was $123.6 million, $119.4 million and $95.5 million for the years ended December 31, 2016, 2015 and 2014, respectively. The decrease in gross profit as a percentage of revenue from 2015 to 2016 was primarily due to product mix. The increase in gross profit as a percentage of revenue from 2014 to 2015 was primarily due to an increase in product and software sales volume and product mix.

Operating Expenses

Our operating expenses consist of:

- Research and Development. The process control defect inspection and metrology, advanced packaging lithography, and data analysis systems and software market is characterized by continuous technological development and product innovations. We believe that the rapid and ongoing development of new products and enhancements of existing products, including the transition to copper and low-k dielectrics, wafer level packaging, the continuous shrinkage in critical dimensions, and the evolution of ultra-thin gate process control, is critical to our success. Accordingly, we devote a significant portion of our technical, management and financial resources to research and development programs. Research and development expenditures consist primarily of salaries and related expenses of employees engaged in research, design and development activities. They also include consulting fees, the cost of related supplies and legal costs to defend our patents. Our research and development expense was $45.0 million, $41.2 million and $40.6 million in 2016, 2015 and 2014, respectively. The year-over-year dollar increase from 2015 to 2016 was primarily due to increased compensation and project costs. The year-over-year dollar increase from 2014 to 2015 was primarily due to increased compensation, litigation and project costs. We continue to maintain our commitment to investing in new product development and enhancement to existing products.
- Selling, General and Administrative. Selling, general and administrative expense is primarily comprised of salaries and related costs for sales, marketing, and general administrative personnel, as well as commissions and other non-personnel related expenses. Our selling, general and administrative expense was $38.6 million, $43.2 million and $53.8 million in 2016, 2015 and 2014, respectively. The year-over-year dollar decrease from 2015 to 2016 was primarily due to a decrease in share-based compensation costs. The decrease from 2014 to 2015 was due primarily to a significant increase to litigation expenses in 2014 related to the final judgment awarded to Integrated Technology Corporation (“ITC”). There were also restructuring charges in 2014 due primarily to the closure of our facility in Mainz, Germany. The changes were offset slightly by higher share based compensation expenses in 2015 and 2014.
- Amortization of Identifiable Intangible Assets. Amortization of identifiable intangible assets was $2.3 million, $2.1 million and $2.4 million in 2016, 2015 and 2014, respectively. The year-over-year increase in amortization expense in 2016 was due primarily to a full year of amortization of intangibles for the Stella Acquisition that took place in the fourth quarter of 2015. The year-over-year decreases in amortization expense from 2014 to 2015 were due to certain intangible assets becoming fully amortized during the periods.

Interest expense, net. In 2016, 2015 and 2014, net interest expense was $2.8 million, $5.7 million and $5.3 million, respectively. The year-over-year decrease in net interest expense for 2016 was primarily due to the redemption of our Convertible Senior Notes in July 2016. The year-over-year increase in net interest expense from 2014 to 2015 was primarily due to increased amortization of the interest discount related to the Convertible Senior Notes.

Table of Contents

Income taxes. The following table provides details of income tax (dollars in millions):

	Year Ended December 31,		
	2016	2015	2014
Income (loss) before income taxes	$49.9	$26.8	$(6.7)
Provision (benefit) for income taxes	$12.9	$8.9	$(2.1)
Effective tax rate	25.9 %	33.0 %	30.7 %

The income tax provision differs from the federal statutory income tax rate of 35% for 2016, primarily due to research and development credits of $0.7 million, section 199 manufacturing deduction of $1.2 million, the foreign taxes net of federal benefit of $1.6 million and deferred tax true-ups of $1.7 million from prior periods.

The income tax provision differs from the federal statutory income tax rate of 35% for 2015, primarily due to research and development credits, section 199 manufacturing deduction and a decrease in our valuation allowance, partially offset by taxes accrued in foreign jurisdictions.

The income tax benefit differs from the federal statutory income tax rate of 35% for 2014, primarily due to an increase in our valuation allowance and taxes accrued in foreign jurisdictions, partially offset by research and development tax credits.

Litigation. During the twelve months ended December 31, 2016, we recorded income and received cash from a patent litigation judgment of $14.6 million in conjunction with the final court ruling in the patent infringement litigation case against Camtek, Ltd. (“Camtek”) with the expiration of all opportunities to appeal. As discussed in Part I, Item 3. “Legal Proceedings” and Note 8. in the accompanying consolidated financial statements included in this Annual Report on Form 10-K, we are subject to separate legal proceedings and claims, which include, among other things, our litigation with Camtek.

Liquidity and Capital Resources

At December 31, 2016, we had $125.7 million of cash, cash equivalents and marketable securities and $226.7 million in working capital. At December 31, 2015, our cash, cash equivalents and marketable securities totaled $161.5 million, while working capital amounted to $197.3 million.

Typically during periods of revenue growth, changes in accounts receivable and inventories represent a use of cash as we incur costs and expend cash in advance of receiving cash from our customers. Similarly, during periods of declining revenue, changes in accounts receivable and inventories represent a source of cash as inventory purchases decline and revenue from prior periods is collected.

Net cash and cash equivalents provided by operating activities for the years ended December 31, 2016, 2015 and 2014 totaled $46.6 million, $33.8 million and $4.3 million, respectively. During the year ended December 31, 2016, cash provided by operating activities was primarily due to net income, adjusted to exclude the effect of non-cash charges, of $57.7 million, a decrease in inventories of $4.0 million, a decrease in prepaid expenses and other assets of $2.0 million, an increase in accounts payable of $1.2 million, an increase in deferred revenue of $0.9 million, partially offset by an increase in accounts receivable of $9.3 million, a net increase in income tax receivable of $3.8 million, a decrease in other liabilities of $6.1 million.

During the year ended December 31, 2015, cash provided by operating activities was primarily due to net income, adjusted to exclude the effect of non-cash charges, of $42.9 million, an increase in accounts payable of $2.3 million, an increase in income tax payable of $2.6 million, an increase in other liabilities of $3.5 million and a decrease in prepaid expenses and other assets of $1.0 million, partially offset by an increase in inventories of $12.5 million, an increase in accounts receivable of $4.3 million, and a decrease in deferred revenue of $1.5 million.

During the year ended December 31, 2014, cash provided by operating activities was primarily due to net loss, adjusted to exclude the effect of non-cash charges, of $12.4 million, and an increase in accounts payable of $3.8 million, a decrease in income taxes receivable of $1.2 million, and a decrease in accounts receivable of $1.1 million, partially offset by an increase in inventories of $9.4 million, an increase in prepaid expenses and other assets of $4.7 million, an increase in other liabilities of $0.5 million, and a decrease in deferred revenue of $0.4 million.

31

Table of Contents

Net cash and cash equivalents provided by (used in) investing activities for the years ended December 31, 2016, 2015 and 2014 totaled $24.5 million, $(9.1) million and $(28.5) million, respectively. During the year ended December 31, 2016, net cash provided by investing activities included proceeds from sales of marketable securities of $175.5 million and proceeds from sale of property, plant and equipment of $1.2 million, which were partially offset by purchases of marketable securities of $146.9 million, purchases of property, plant and equipment of $3.3 million, and purchase of intangible assets of $2.0 million. During the year ended December 31, 2015, net cash used by investing activities included purchases of marketable securities of $237.1 million, purchases of property, plant and equipment of $3.4 million, and purchase of intangible assets of $2.7 million, which were partially offset by proceeds from sales of marketable securities of $234.1 million. During the year ended December 31, 2014, net cash used by investing activities included purchases of marketable securities of $243.7 million, and purchases of property, plant and equipment of $2.1 million, which were partially offset by proceeds from sales of marketable securities of $217.2 million. For 2017, purchases of property, plant and equipment are expected to be approximately $8.0 million to $10.0 million, which includes several large projects and an update to our IT infrastructure. In future periods, the Company expects capital spending to be lower and in line with historical spending patterns.

Net cash used in financing activities was $78.1 million, $23.0 million and $12.7 million in 2016, 2015 and 2014, respectively. In the 2016, financing activities included the redemption of senior convertible debt of $60.0 million, redemption of stock warrants of $9.5 million, purchase of shares under the share repurchase authorization of $8.0 million, tax payments related to shares withheld for share based compensation plans of $1.6 million and payment of contingent consideration for acquired business of $0.6 million, partially offset by proceeds from sales of shares through employee stock plans of $0.9 million and tax benefit from employee stock plan of $0.8 million. In the 2015, financing activities primarily included the purchase of shares under the share repurchase authorization of $20.7 million and tax payments related to shares withheld for share based compensation plans. In 2014, financing activities primarily included the purchase of shares under the share repurchase authorization of $12.8 million.

From time to time we evaluate whether to acquire new or complementary businesses, products and/or technologies. We may fund all or a portion of the purchase price of these acquisitions in cash, stock, or a combination of cash and stock.

In January 2015, the Board of Directors authorized the Company to repurchase up to 3.0 million shares of the Company’s common stock with no established end date. The authorization allows for repurchases to be made in the open market or through negotiated transactions from time to time. During the twelve months ended December 31, 2016, we repurchased 0.6 million shares of common stock. At December 31, 2016, there were 0.7 million shares available for future stock repurchases under this repurchase authorization. Shares of common stock purchased under the share repurchase authorization are retired. For further information, see Note 15 in the accompanying consolidated financial statements.

We have a credit agreement with a bank that provides for a line of credit which is secured by the marketable securities we have with the bank. We are permitted to borrow up to 70% of the value of eligible securities held at the time the line of credit is accessed. The available line of credit as of December 31, 2016 was approximately $68.3 million. We entered into our current credit agreement and concurrently terminated a prior credit agreement in June 2016. The credit agreement is available to us until such time that either party terminates the arrangement at their discretion. We have not utilized the line of credit to date.

Our future capital requirements will depend on many factors, including the timing and amount of our revenues and our investment decisions, which will affect our ability to generate additional cash. We expect that our existing cash, cash equivalents, marketable securities and availability under our line of credit will be sufficient to meet our anticipated cash requirements for working capital, capital expenditures and other cash needs for the next twelve months. Thereafter, if cash generated from operations and financing activities is insufficient to satisfy our working capital requirements, we may seek additional funding through bank borrowings, sales of securities or other means. There can be no assurance that we will be able to raise any such capital on terms acceptable to us or at all.

Contractual Obligations

The following table summarizes our significant contractual obligations at December 31, 2016, and the effect such obligations are expected to have on our liquidity and cash flows in future periods. This table excludes the liability for unrecognized tax benefits that totaled approximately $4.8 million at December 31, 2016. We are currently unable to provide a reasonably reliable estimate of the amount or periods when cash settlement of this liability may occur.

Table of Contents

	Payments due by period (In thousands)				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating lease obligations	$9,646	$2,922	$4,401	$1,551	$ 772
Open and committed purchase orders	19,296	18,240	1,056	—	—
Total	$28,942	$21,162	$5,457	$1,551	$ 772

Off-Balance Sheet Arrangements

The Company does not have any significant off-balance sheet arrangements that have or are reasonably likely to have a material effect on our financial condition, results of operations or liquidity and capital resources.

Critical Accounting Policies

Management's discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. We review the accounting policies we use in reporting our financial results on a regular basis. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates, including those related to revenue recognition, accounts receivable, inventories, business acquisitions, intangible assets, share-based payments, income taxes and warranty obligations. We base our estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Results may differ from these estimates due to actual outcomes being different from those on which we based our assumptions. These estimates and judgments are regularly reviewed by management on an ongoing basis at the end of each quarter prior to the public release of our financial results. We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition. Revenue is recognized provided that there is persuasive evidence of an arrangement, delivery has occurred or services have been rendered, the sales price is fixed or determinable, and collection of the related receivable is reasonably assured. Revenue recognition generally results at the following points: (1) for all transactions where legal title passes to the customer upon shipment, revenue is recognized upon shipment for all products that have been demonstrated to meet product specifications prior to shipment; the portion of revenue associated with certain installation-related tasks is deferred, and that revenue is recognized upon completion of the installation-related tasks; (2) for products that have not been demonstrated to meet product specifications prior to shipment, revenue is recognized at customer technical acceptance; (3) for transactions with multiple elements, such as sales of products that include software and services, the revenue relating to the undelivered elements is deferred using the relative selling price method utilizing vendor-specific objective evidence ("VSOE") or estimated sales prices ("ESP") until delivery of the deferred elements. Third-party evidence is not typically used to determine selling prices as to limited availability of reliable competitor products' selling prices. The ESP is established considering multiple factors including, but not limited to, gross margin objectives, internal costs and competitor pricing strategies.

Revenues from parts sales are recognized at the time of shipment. Revenue from training and service contracts is recognized ratably over the training period and contract period. A provision for the estimated cost of fulfilling warranty obligations is recorded at the time the related revenue is recognized.

Revenue from software license fees is recognized upon shipment or customer acknowledgment if collection of the resulting receivable is probable, the fee is fixed or determinable, and VSOE exists to allocate a portion of the total fee to any undelivered elements of the arrangement. License support and maintenance revenue is recognized ratably over the contract period.

Deferred revenue represents undelivered items, prepaid service contract revenue and prepaid license support and maintenance revenue. Deferred revenue is recognized in accordance with our revenue recognition policies described above.

Table of Contents

Allowance for Doubtful Accounts. We maintain allowances for doubtful accounts for estimated losses resulting from the inability of our customers to make required payments. We specifically analyze accounts receivable and analyze historical bad debts, customer concentrations, customer credit-worthiness, current economic trends and changes in our customer payment terms when evaluating the adequacy of the allowance for doubtful accounts. If the financial condition of our customers were to deteriorate, resulting in an impairment of their ability to make payments, or if our assumptions are otherwise incorrect, additional allowances may be required.

Excess and Obsolete Inventory. We maintain reserves for our excess and obsolete inventory equal to the difference between the cost of inventory and the estimated market value based upon assumptions about future product life-cycles, product demand and market conditions. If actual product life-cycles, product demand and market conditions are less favorable than those originally projected by management, additional inventory write-downs may be required.

Business Acquisitions. We account for acquired or merged businesses using the purchase method of accounting which requires that the assets acquired and liabilities assumed be recorded at the date of acquisition or merger at their respective fair values. The judgments made in determining the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives, can materially impact our consolidated financial position and results of operations. Accordingly, for significant acquisitions, we typically obtain assistance from independent valuation specialists.

There are several methods that can be used to determine the fair value of assets acquired and liabilities assumed. For intangible assets, we typically utilize the “income method.” This method starts with a forecast of all of the expected future net cash flows. These cash flows are then adjusted to present value by applying an appropriate discount rate that reflects the risk factors associated with the cash flow streams. Some of the more significant estimates and assumptions inherent in the income method or other methods include the projected future cash flows (including timing) and the discount rate reflecting the risks inherent in the future cash flows. Determining the useful life of an intangible asset also requires judgment. For example, different types of intangible assets will have different useful lives and certain assets may even be considered to have indefinite useful lives. All of these judgments and estimates can significantly impact our consolidated financial position and results of operations.

Goodwill. Our formal annual impairment testing date for goodwill is October 31st or prior to the next annual testing date if an event occurs or circumstances change that would make it more likely than not that the fair value of a reporting unit is below its carrying amount. We have the option to first assess qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If, we elect this option and after assessing the totality of events or circumstances, we determine it is not likely that the fair value of a reporting unit is less than its carrying amount, then performing the two-step impairment test is unnecessary. We have not elected this option to date. The goodwill impairment test is a two-step process which requires us to make judgmental assumptions regarding fair value. The first step consists of estimating the fair value of our aggregated reporting unit using the market value of our common stock at October 31st, multiplied by the number of outstanding common shares (market capitalization) and an implied control premium as if it were to be acquired by a single stockholder. We obtain information on completed sales of similar companies in a comparable industry to estimate an implied control premium for us. We compare the estimated fair value of the reporting unit to its carrying value which includes goodwill. If the results of the initial market capitalization test produce results which are below the reporting unit carrying value, we will also consider if the market capitalization is temporarily low and, if so, we may also perform a discounted cash flow test. If the estimated fair value is less than the carrying value, the second step is completed to compute the impairment amount by determining the “implied fair value” of goodwill. This determination requires the allocation of the estimated fair value of the reporting unit to the assets and liabilities of the reporting unit. Any remaining unallocated fair value represents the “implied fair value” of goodwill which is compared to the corresponding carrying value to compute the goodwill impairment amount. We are not required to perform the second step during our annual impairment test.

Long-Lived Assets and Acquired Intangible Assets. We periodically review long-lived assets, other than goodwill, for impairment whenever changes in events or circumstances indicate that the carrying amount of an asset may not be

recoverable. Assumptions and estimates used in the determination of impairment losses, such as future cash flows and disposition costs, may affect the carrying value of long-lived assets and the impairment of such long-lived assets, if any, could have a material effect on our consolidated financial statements. No such indicators were noted in 2016.
Share-Based Compensation. We are required to estimate the expected forfeiture rate of our share grants and only recognize the expense for those shares expected to vest. If the actual forfeiture rate is materially different from our estimate, our share-based compensation expense could be materially different.

Table of Contents

Warranties. We provide for the estimated cost of product warranties at the time revenue is recognized. While we engage in product quality programs and processes, our warranty obligation is affected by product failure rates, material usage and service delivery costs incurred in correcting a product failure. Should actual product failure rates, material usage or service delivery costs differ from our estimates, revisions to the estimated warranty liability would be required.

Accounting for Income Taxes. As part of the process of preparing our consolidated financial statements, we are required to estimate our actual current tax exposure together with our temporary differences resulting from differing treatment of items for tax and accounting purposes. These temporary differences result in deferred tax assets and liabilities, which are included within our consolidated balance sheet. We must then assess the likelihood that our deferred tax assets will be recovered from future taxable income and to the extent we believe that recovery is not likely, we must establish a valuation allowance. Significant management judgment is required in determining our provision for income taxes and any valuation allowance recorded against our deferred tax assets. The need for a valuation allowance is based on our estimates of taxable income by jurisdiction in which we operate and the period over which our deferred taxes will be recoverable. In the event that actual results differ from these estimates or we adjust these estimates in future periods, we may need to adjust the valuation allowance, which could materially impact our financial position and results of operations. At December 31, 2016 and 2015, we had valuation allowances of $1.9 million and $2.2 million on certain of our deferred tax assets to reflect, the deferred tax assets at the net amount that is more likely than not to be realized. We evaluated the realizability of the deferred tax assets based on positive earnings from 2014 through 2016 as well as the projected earnings in future years and believe it is more likely than not that the deferred tax asset will be realized in the future years. We will continue to monitor the realizability of the deferred tax assets and evaluate the valuation allowance.

We recognize liabilities for uncertain tax positions based on a two-step process. The first step requires us to determine if the weight of available evidence indicates that the tax position has met the threshold for recognition; therefore, we must evaluate whether it is more likely than not that the position will be sustained on audit, including resolution of any related appeals or litigation processes. The second step requires us to measure the tax benefit of the tax position taken, or expected to be taken, in an income tax return as the largest amount that is more than 50% likely of being realized when effectively settled. This measurement step is inherently difficult and requires subjective estimations of such amounts to determine the probability of various possible outcomes. We reevaluate the uncertain tax positions each quarter based on factors including, but not limited to, changes in facts or circumstances, changes in tax law, effectively settled issues, and new audit activity. Such a change in recognition or measurement could result in the recognition of a tax benefit or an additional charge to the tax provision in the period.

Although we believe the measurement of our liabilities for uncertain tax positions is reasonable, no assurance can be given that the final outcome of these matters will not be different than what is reflected in the historical income tax provisions and accruals. If additional taxes are assessed as a result of an audit or litigation, it could have a material effect on our income tax provision and net income in the period or periods for which that determination is made.

Impact of Recent Accounting Pronouncements

In January 2017, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2017-04, “Intangibles - Goodwill and Other (Topic 350), ‘Simplifying the Test for Goodwill Impairment.” This ASU would eliminate Step 2 from the goodwill impairment test. The ASU is effective for the fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. We are currently evaluating the effect the adoption of ASU No. 2017-04 will have on our consolidated financial position, results of operations, and cash flows.

In October 2016, the FASB issued ASU No. 2016-16, “Income Tax (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory.” This ASU which is part of the Board’s simplification initiative, is intended to reduce the complexity of U.S. GAAP and diversity in practice related to the tax consequences of certain types of intra-entity asset transfers, particularly those involving intellectual property. This ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. We are currently evaluating the effect the adoption of ASU No. 2016-16 will have on our consolidated financial position, results of operations, and cash flows.

In August 2016, the FASB issued ASU No. 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments.” This ASU provides guidance on statement of cash flows presentation for eight specific cash flow issues where diversity in practice exists. This ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. We are currently evaluating the effect the adoption of ASU No. 2016-15 will have on our consolidated financial position, results of operations, and cash flows.

Table of Contents

In June 2016, the FASB issued ASU No. 2016-13, “Financial Instruments – Credit Losses (Topic 326),” which introduces new guidance for the accounting for credit losses on instruments within its scope. Given the breadth of that scope, the new ASU will impact both financial services and non-financial services entities. The standard is effective for fiscal years beginning after December 15, 2020. We are currently evaluating the effect the adoption of ASU No. 2016-13 will have on our consolidated financial position, results of operations, and cash flows.

In March 2016, the FASB issued ASU No. 2016-09, “Compensation - Stock Compensation (Topic 718), Improvements to Employee Share-Based Payment Accounting.” The standard was issued as part of the Simplification Initiative which involves several aspects of the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within annual periods beginning after December 15, 2016. We are currently evaluating the effect the adoption of ASU No. 2016-09 will have on our consolidated financial position, results of operations, and cash flows.

In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842).” The standard requires that lessees will be required to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with terms of more than 12 months. ASU No. 2016-02 also will require disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. These disclosures include qualitative and quantitative information. The standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018 with earlier adoption permitted. We are in the process of evaluating the effects the adoption of ASU No. 2016-02 will have on our consolidated financial position, results of operations, and cash flows.

In July 2015, the FASB issued ASU No. 2015-11, “Inventory (Topic 330), Simplifying the Measurement of Inventory.” This ASU is intended to simplify subsequent measurement of inventory. An entity should measure inventory within the scope of this ASU at the lower of cost and net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable cost of completion, disposal, and transportation. The standard is effective for annual periods and interim periods within those annual periods, beginning after December 15, 2016. The adoption of ASU 2015-11 is not expected to have a material effect on our consolidated financial position, results of operations, and cash flows.

In May 2014, the FASB issued ASU No. 2014-09, “Revenue from Contracts with Customers (Topic 606).” ASU No. 2014-09, as amended, outlines a comprehensive revenue recognition model and supersedes most current revenue recognition guidance as amended. In July 2015, the FASB deferred for one year the effective date of the new revenue standard. The standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017 with earlier adoption permitted. ASU No. 2014-09 allows for two methods of adoption: (a) “full retrospective” adoption, meaning the standard is applied to all periods presented, or (b) “modified retrospective” adoption, meaning the cumulative effect of applying ASU No. 2014-09 is recognized as an adjustment to the 2018 opening retained earnings balance. We are in the process of determining the adoption method as well as the effects the adoption of ASU No. 2014-09 will have on our consolidated financial position, results of operations, and cash flows.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Interest Rate and Credit Market Risk

We are exposed to changes in interest rates and market liquidity including our investments in certain available-for-sale securities. Our available-for-sale securities consist of fixed and variable rate debt investments (municipal notes and bonds). We continually monitor our exposure to changes in interest rates, market liquidity and credit ratings of issuers from our available-for-sale securities. It is possible that we are at risk if interest rates, market liquidity or credit ratings of issuers change in an unfavorable direction. The magnitude of any gain or loss will be a function of the difference between the fixed rate of the financial instrument and the market rate and our financial condition and results of operations could be materially affected. Based on a sensitivity analysis performed on our financial investments held as of December 31, 2016, an immediate adverse change of 10% in interest rates (e.g. 3.00% to 3.30%) would result in an immaterial decrease in the fair value of our available-for-sale securities. Therefore, any change in interest rates will

not have an impact on our consolidated financial position, results of operations or cash flows.

Table of Contents

Foreign Currency Risk

We have branch operations in Taiwan, Singapore and South Korea and wholly-owned subsidiaries in Europe, Japan and China. Our international subsidiaries and branches operate primarily using local functional currencies. A hypothetical 10% appreciation or depreciation in the U.S. dollar relative to the reporting currencies of our foreign subsidiaries at December 31, 2016 would have affected the foreign-currency-denominated non-operating expenses of our foreign subsidiaries by approximately $3.4 million. We cannot accurately predict future exchange rates or the overall impact of future exchange rate fluctuations on our business, results of operations and financial condition.

A substantial portion of our international systems sales are denominated in U.S. dollars with the exception of Japan and, as a result, we have relatively little exposure to foreign currency exchange risk with respect to these sales. Substantially all our sales in Japan are denominated in Japanese yen. From time to time, we may enter into forward exchange contracts to economically hedge a portion of, but not all, existing and anticipated foreign currency denominated transactions expected to occur within 12 months. The change in fair value of the forward contracts is recognized in the Consolidated Statements of Operations each reporting period. As of December 31, 2016 and 2015, we had nineteen and thirteen forward contracts outstanding, respectively. The total notional contract value of these outstanding forward contracts at December 31, 2016 and 2015 was $3.8 million and $5.4 million, respectively. We do not use derivative financial instruments for trading or speculative purposes.

Item 8. Financial Statements and Supplementary Data.

The consolidated financial statements and related information required by this item are set forth on the pages indicated in Item 15(a) of this Annual Report on Form 10-K.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information we are required to disclose in reports that we file or submit under the Securities Exchange Act of 1934, as amended (the “Exchange Act”) is recorded, processed, summarized and reported within the time period specified in SEC rules and forms. These controls and procedures are also designed to ensure that such information is accumulated and communicated to our management, including our principal executive and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating disclosure controls and procedures, we have recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. Management is required to apply judgment in evaluating its controls and procedures.

We performed an evaluation under the supervision and with the participation of our management, including our principal executive and principal financial officers, to assess the effectiveness of the design and operation of our disclosure controls and procedures under the Exchange Act as of December 31, 2016. Based on that evaluation, our management, including our principal executive and principal financial officers, concluded that our disclosure controls and procedures were effective as of December 31, 2016 at the reasonable assurance level.

Management’s Report on Internal Control Over Financial Reporting

Our management is responsible 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). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in Internal Control — Integrated Framework issued by the

Committee of

Table of Contents

Sponsoring Organizations of the Treadway Commission (2013 framework) ("COSO"). Based on our evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2016. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our consolidated financial statements as of and for the year ended December 31, 2016 have been audited by Ernst & Young LLP, our independent registered public accounting firm, in accordance with the standards of the Public Company Accounting Oversight Board (United States). Ernst & Young LLP has also audited our internal control over financial reporting as of December 31, 2016, as stated in its attestation report included elsewhere in this Annual Report on Form 10-K.

There have been no changes in the Company's internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) that occurred during the Company's quarter ended December 31, 2016 that have materially affected, or are reasonably likely to materially affect, its internal control over financial reporting.

Item 9B. Other Information.

None.

Table of Contents

PART III

Certain information required by Part III is omitted from this Annual Report on Form 10-K because we expect to file a definitive proxy statement within one hundred twenty (120) days after the end of our fiscal year pursuant to Regulation 14A (the "Proxy Statement") for our Annual Meeting of Stockholders currently scheduled for May 17, 2017, and the information included in the Proxy Statement is incorporated herein by reference.

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item with respect to directors and executive officers, is included under the headings "Proposal One: Election of Directors," "Executive Officers" and "Corporate Governance Principles and Practices" in the Proxy Statement, which is incorporated herein by reference. Information regarding compliance with Section 16 of the Securities Exchange Act of 1934, as amended, is incorporated by reference to the information under the heading "Section 16(a) Beneficial Ownership Reporting Compliance" in the Proxy Statement.

Code of Ethics. We have adopted a code of ethics that applies to our principal executive officer, principal financial officer and controller. This code of ethics is posted on our internet website address at http://www.rudolphtech.com. We will post on our website any amendment to or waiver from a provision of our code of ethics as may be required, and within the time period specified, by applicable SEC rules.

Item 11. Executive Compensation.

The information required by this Item, is included under the headings "Executive Compensation," "Compensation of Directors," "Compensation Committee Report on Executive Compensation," "Stock Ownership/Retention Guidelines for Directors" and "Compensation Committee Interlocks and Insider Participation" in the Proxy Statement, which is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this Item, is included under the headings "Security Ownership" and "Equity Compensation Plan Information" in the Proxy Statement, which is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this Item, is included under the headings "Related Persons Transactions Policy" and "Board Independence" in the Proxy Statement, which is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this Item, is included under the heading "Proposal 3: Ratification of Appointment of Independent Registered Public Accounting Firm" in the Proxy Statement, which is incorporated herein by reference.

Table of Contents

PART IV

Item 15. Exhibits and Financial Statement Schedule.

(a)The following documents are filed as part of this Annual Report on Form 10-K:

1. Financial Statements

The consolidated financial statements and consolidated financial statement information required by this Item are included on pages F-1 through F-8 of this report. The Reports of Independent Registered Public Accounting Firm appear on pages F-2 through F-3 of this report.

2. Financial Statement Schedule

See Index to financial statements on page F-1 of this report.

3. Exhibits

The following is a list of exhibits. Where so indicated, exhibits, which were previously filed, are incorporated by reference.

Exhibit No.	Description
3.1	Restated Certificate of Incorporation of Registrant, as amended (Conformed Version) (incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q (SEC File No. 000-27965) filed on August 2, 2013).
3.2	Restated Bylaws of Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on August 1, 2007).
3.3	Amendment to Restated Bylaws of Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on February 2, 2009).
4.1	August Technology Corporation 1997 Stock Incentive Plan (incorporated by reference to the Appendix to August Technology Corporation's Proxy Statement for its 2004 Annual Shareholders Meeting (SEC File No. 000-30637) filed on March 11, 2004).
10.1+	License Agreement, dated June 28, 1995, between the Registrant and Brown University Research Foundation (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1, as amended (SEC File No. 333-86821), filed on September 9, 1999).
10.2*	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form S-1/A, as amended (SEC File No. 333-86821), filed on October 14, 1999).
10.3*	Form of 1999 Stock Plan (incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form S-1, (SEC File No. 333-86821) filed on September 9, 1999).

_____

+ Confidential treatment has been granted with respect to portions of this exhibit.

Table of Contents

Exhibit No.	Description
10.4*	Management Agreement, dated as of July 24, 2000 by and between Rudolph Technologies, Inc. and Steven R. Roth as restated and amended on July 29, 2014 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed on August 6, 2014).
10.5*	Employment Agreement, dated as of November 9, 2015, by and between Rudolph Technologies, Inc. and Michael Plisinski (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on November 9, 2015). *
10.6*	Executive Change of Control Agreement, dated February 7, 2014, by and between Rudolph Technologies, Inc. and Richard Rogoff (incorporated by reference to Exhibit 10.10 to the Registrant's Annual Report on Form 10-K filed on February 20, 2015.
10.7*	Executive Change of Control Agreement, dated August 20, 2009, by and between Rudolph Technologies, Inc. and Robert A. Koch (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed on November 06, 2009.
10.8*	Form of option agreement under 1999 Stock Plan (incorporated by reference to Exhibit 10.12 to the Registrant's Quarterly Report on Form 10-Q (SEC File No. 000-27965) filed on November 5, 2004).
10.9*	Form of Restricted Stock Award pursuant to the Rudolph Technologies, Inc. 1999 Stock Plan (incorporated by reference to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965), filed on June 21, 2005).
10.10*	Rudolph Technologies, Inc. 2009 Stock Plan (incorporated by reference to Appendix A of the Registrant's revised Proxy Statement on Form DEFR14A, filed on May 8, 2009).
10.11*	Rudolph Technologies, Inc. 2009 Employee Stock Purchase Plan, as amended (incorporated by reference to Appendix B of the Registrant's revised Proxy Statement on Form DEFR14A, filed on May 8, 2009).
10.12*	Amended form of Restricted Stock Unit Agreement pursuant to the Rudolph Technologies, Inc. 2009 Stock Plan filed herewith.
10.13	Confirmation of Issuer Warrant Transaction dated July 19, 2011, by and between Rudolph Technologies, Inc. and Credit Suisse International (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on July 25, 2011).
10.14	Amendment dated July 22, 2011 to Confirmation of Issuer Warrant Transaction dated July 19, 2011, by and between Rudolph Technologies, Inc. and Credit Suisse International (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on July 25, 2011).

* Management contract, compensatory plan or arrangement.

Table of Contents

Exhibit No.	Description
21.1	Subsidiaries.
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm.
31.1	Certification of Michael P. Plisinski, Chief Executive Officer, pursuant to Securities Exchange Act Rule 13a-14(a).
31.2	Certification of Steven R. Roth, Chief Financial Officer, pursuant to Securities Exchange Act Rule 13a-14(a).
32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, signed by Michael P. Plisinski, Chief Executive Officer of Rudolph Technologies, Inc.
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, signed by Steven R. Roth, Chief Financial Officer of Rudolph Technologies, Inc.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS AND
FINANCIAL STATEMENT SCHEDULE

Table of Contents

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
of Rudolph Technologies, Inc.

We have audited the accompanying consolidated balance sheets of Rudolph Technologies, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive income (loss), stockholders' equity and cash flows for each of the three years in the period ended December 31, 2016. Our audits also included the financial statement schedule listed in the Index at Item 15(a). These financial statements and schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and schedule 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. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes 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 financial statements referred to above present fairly, in all material respects, the consolidated financial position of Rudolph Technologies, Inc. at December 31, 2016 and 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles. Also, in our opinion, the related financial statement schedule, when considered in relation to the basic financial statements taken as a whole, presents fairly in all material respects the information set forth therein.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Rudolph Technologies, Inc.’s internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 16, 2017, expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP
Metropark, New Jersey
February 16, 2017

Table of Contents

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of
Rudolph Technologies, Inc.

We have audited Rudolph Technologies, Inc. internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Rudolph Technologies, Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit 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 effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of 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 (3) 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 financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, Rudolph Technologies, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Rudolph Technologies, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive income (loss), stockholders' equity and cash flows for each of the three years in the period ended December 31, 2016 of Rudolph Technologies, Inc. and our report dated February 16, 2017 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Metropark, New Jersey
February 16, 2017

F-3

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except per share data)

	December 31,	
	2016	2015
ASSETS		
Current Assets:		
Cash and cash equivalents	$37,859	$44,554
Marketable securities	87,872	116,924
Accounts receivable, less allowance of $680 in 2016 and $713 in 2015	64,912	55,492
Inventories	65,485	71,490
Income taxes receivable	2,389	—
Prepaid expenses and other current assets	4,113	8,137
Total current assets	262,630	296,597
Property, plant and equipment, net	11,858	12,346
Goodwill	22,495	22,495
Identifiable intangible assets, net	10,273	12,593
Deferred income taxes	30,850	34,973
Other assets	593	559
Total assets	$338,699	$379,563
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$10,245	$9,094
Accrued liabilities:		
Payroll and related expenses	8,968	10,142
Royalties	493	336
Warranty	1,788	1,894
Convertible senior notes	—	57,846
Income tax payable	—	1,163
Deferred revenue	7,329	6,441
Other current liabilities	7,139	12,415
Total current liabilities	35,962	99,331
Other non-current liabilities	9,002	9,554
Total liabilities	44,964	108,885
Commitments and contingencies (Note 8)		
Stockholders' equity:		
Preferred stock, $0.001 par value, 5,000 shares authorized, no shares issued and outstanding at December 31, 2016 and 2015	—	—
Common stock, $0.001 par value, 100,000 shares authorized, 31,127 and 30,949 issued and outstanding at December 31, 2016 and 2015, respectively	31	31
Additional paid-in capital	381,189	394,928
Accumulated other comprehensive loss	(2,779)	(2,623)
Accumulated deficit	(84,706)	(121,658)
Total stockholders' equity	293,735	270,678
Total liabilities and stockholders' equity	$338,699	$379,563

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

F-4

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share data)

	Year Ended December 31,		
	2016	2015	2014
Revenues	$232,780	$221,690	$181,218
Cost of revenues	109,229	102,284	85,730
Gross profit	123,551	119,406	95,488
Operating expenses:			
Research and development	44,964	41,233	40,576
Selling, general and administrative	38,562	43,235	53,799
Amortization	2,320	2,145	2,422
Patent litigation judgment	(14,643)	—	—
Total operating expenses	71,203	86,613	96,797
Operating income (loss)	52,348	32,793	(1,309)
Interest expense, net	2,834	5,688	5,317
Other expense (income)	(354)	293	65
Income (loss) before income taxes	49,868	26,812	(6,691)
Provision (benefit) for income taxes	12,916	8,856	(2,051)
Net income (loss)	$36,952	$17,956	$(4,640)
Earnings (loss) per share:			
Basic	$1.19	$0.57	$(0.14)
Diluted	$1.16	$0.56	$(0.14)
Weighted average number of shares outstanding:			
Basic	31,128	31,408	33,124
Diluted	31,790	32,166	33,124

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

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(In thousands)

	Year Ended December 31,		
	2016	2015	2014
Net income (loss)	$36,952	$17,956	$(4,640)
Other comprehensive income (loss):			
Change in net unrealized gains (losses) on investments, net of tax	(37)	(33)	183
Change in currency translation adjustments	(119)	62	(1,040)
Total comprehensive income (loss)	$36,796	$17,985	$(5,497)

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

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
For the years ended December 31, 2016, 2015 and 2014
(In thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total
	Shares	Amount				
Balance at December 31, 2013	32,953	33	415,739	(1,795)	(134,974)	279,003
Issuance of shares through share-based compensation plans	493	—	362	—	—	362
Repurchase of common stock	(1,353)	(1)	(12,844)	—	—	(12,845)
Net income	—	—	—	—	(4,640)	(4,640)
Share-based compensation	—	—	6,242	—	—	6,242
Tax benefit for share-based compensation plans	—	—	63	—	—	63
Currency translation	—	—	—	(1,040)	—	(1,040)
Unrealized gain on investments	—	—	—	183	—	183
Balance at December 31, 2014	32,093	32	409,562	(2,652)	(139,614)	267,328
Issuance of shares through share-based compensation plans, net	530	—	330	—	—	330
Repurchase of common stock	(1,674)	(1)	(20,667)	—	—	(20,668)
Net income	—	—	—	—	17,956	17,956
Share-based compensation	—	—	7,603	—	—	7,603
Tax benefit for share-based compensation plans	—	—	16	—	—	16
Share-based compensation plan withholdings	—	—	(1,916)	—	—	(1,916)
Currency translation	—	—	—	62	—	62
Unrealized loss on investments	—	—	—	(33)	—	(33)
Balance at December 31, 2015	30,949	31	394,928	(2,623)	(121,658)	270,678
Issuance of shares through share-based compensation plans, net	713	—	850	—	—	850
Repurchase of common stock	(615)	—	(8,044)	—	—	(8,044)
Net income	—	—	—	—	36,952	36,952
Share-based compensation	—	—	4,775	—	—	4,775
Tax benefit for share-based compensation plans	—	—	792	—	—	792
Share-based compensation plan withholdings	—	—	(1,587)	—	—	(1,587)
Redemption of stock warrants	80	—	(10,525)	—	—	(10,525)
Currency translation	—	—	—	(119)	—	(119)
Unrealized loss on investments	—	—	—	(37)	—	(37)
Balance at December 31, 2016	31,127	$ 31	381,189	$ (2,779)	$ (84,706)	$293,735

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

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,		
	2016	2015	2014
Cash flows from operating activities:			
Net income (loss)	$36,952	$17,956	$(4,640)
Adjustments to reconcile net income to net cash and cash equivalents provided by operating activities:			
Depreciation	3,677	3,951	4,686
Amortization of convertible note discount and issuance costs	2,154	3,766	3,385
Amortization of intangibles and other	2,320	2,145	2,427
Foreign currency exchange loss	592	293	65
Gain on disposal of property, plant and equipment	(946)	—	—
Change in fair value of contingent consideration	170	(630)	120
Share-based compensation	4,775	7,603	6,242
Provision for doubtful accounts and inventory valuation	2,971	3,826	4,064
Deferred income taxes	5,011	3,980	(3,937)
Change in operating assets and liabilities, excluding effects of business combinations:			
Accounts receivable	(9,279)	(4,336)	1,147
Income taxes	(3,813)	2,610	1,196
Inventories	4,003	(12,529)	(9,393)
Prepaid expenses and other assets	2,038	953	(4,690)
Accounts payable	1,169	2,254	3,758
Deferred revenue	896	(1,535)	363
Other liabilities	(6,057)	3,486	(503)
Net cash and cash equivalents provided by operating activities	46,633	33,793	4,290
Cash flows from investing activities:			
Purchases of marketable securities	(146,865)	(237,127)	(243,656)
Proceeds from sales of marketable securities	175,460	234,105	217,212
Purchases of property, plant and equipment	(3,291)	(3,359)	(2,084)
Purchase of intangible assets	(2,000)	(2,696)	—
Proceeds from sale of property, plant & equipment	1,165	—	—
Net cash and cash equivalents provided by (used in) investing activities	24,469	(9,077)	(28,528)
Cash flows from financing activities:			
Payment of senior convertible debt	(60,000)	—	—
Redemption of stock warrants	(9,500)	—	—
Purchases of common stock	(8,044)	(20,668)	(12,845)
Tax payments related to shares withheld for share-based compensation plans	(1,587)	(1,916)	—
Payment of contingent consideration for acquired business	(622)	(731)	(264)
Issuance of shares through share-based compensation plans	850	330	362
Tax benefit for sale of shares through share-based compensation plans	792	16	63
Net cash and cash equivalents used in financing activities	(78,111)	(22,969)	(12,684)
Effect of exchange rate changes on cash and cash equivalents	314	(307)	(754)
Net increase (decrease) in cash and cash equivalents	(6,695)	1,440	(37,676)
Cash and cash equivalents at beginning of year	44,554	43,114	80,790
Cash and cash equivalents at end of year	$37,859	$44,554	$43,114

Supplemental disclosure of cash flow information:			
Income taxes paid, net	$10,980	$2,013	$1,067
Interest paid	$2,250	$2,250	$2,250
Litigation settlement (received) paid	$(14,643)	$—	$10,613
Non-cash financing and investing activities:			
Purchase of intangible assets	$—	$3,000	$—

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

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(In thousands, except per share data)

1. Organization and Nature of Operations:

Rudolph Technologies, Inc. (the "Company") designs, develops, manufactures and supports high-performance process control defect inspection, advanced packaging lithography, metrology and process control software systems used in semiconductor device manufacturing. The Company has branch sales and service offices in South Korea, Taiwan and Singapore and wholly-owned sales and service subsidiaries in the United States, Europe, Japan and China. The Company operates in a single segment and is a provider of process characterization equipment and software for wafer fabs and advanced packaging facilities.

2. Summary of Significant Accounting Policies:

A. Consolidation:

The consolidated financial statements reflect the accounts of the Company and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated.

B. Revenue Recognition:

Revenue is recognized provided that there is persuasive evidence of an arrangement, delivery has occurred or services have been rendered, the sales price is fixed or determinable, and collection of the related receivable is reasonably assured. Revenue recognition generally results at the following points: (1) for all transactions where legal title passes to the customer upon shipment, revenue is recognized upon shipment for all products that have been demonstrated to meet product specifications prior to shipment; the portion of revenue associated with certain installation-related tasks is deferred, and that revenue is recognized upon completion of the installation-related tasks; (2) for products that have not been demonstrated to meet product specifications prior to shipment, revenue is recognized at customer technical acceptance; (3) for transactions with arrangements with multiple elements, such as sales of products that include software and services, the revenue relating to the undelivered elements is deferred using the relative selling price method utilizing vendor-specific objective evidence ("VSOE") or estimated sales prices ("ESP") until delivery of the deferred elements. Third-party evidence is not typically used to determine selling prices as to limited availability of reliable competitor products' selling prices. The ESP is established considering multiple factors including, but not limited to, gross margin objectives, internal costs and competitor pricing strategies.

Revenues from parts sales are recognized at the time of shipment. Revenue from training and service contracts is recognized ratably over the training period and contract period. A provision for the estimated cost of fulfilling warranty obligations is recorded at the time the related revenue is recognized.

Revenue from software license fees is recognized upon shipment or customer acknowledgment if collection of the resulting receivable is probable, the fee is fixed or determinable, and VSOE exists to allocate a portion of the total fee to any undelivered elements of the arrangement. License support and maintenance revenue is recognized ratably over the contract period.

Deferred revenue represents undelivered items, prepaid service contract revenue and prepaid license support and maintenance revenue. Deferred revenue is recognized in accordance with the Company's revenue recognition policies described above.

C. Estimates:

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

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. Significant estimates made by management include allowance for doubtful accounts, inventory obsolescence, fair value of assets acquired and liabilities assumed in a business combination (including contingent consideration), recoverability and useful lives of property, plant and equipment and identifiable intangible assets, recoverability of goodwill, recoverability of deferred tax assets, liabilities for product warranty, contingencies, including litigation reserves and share-based payments, including forfeitures and liabilities for tax uncertainties. Actual results could differ from those estimates.

D. Cash and Cash Equivalents:

Cash and cash equivalents include cash and highly liquid debt instruments with original maturities of three months or less when purchased.

E. Marketable Securities:

The Company determined that all of its investment securities are to be classified as available-for-sale. Available-for-sale securities are carried at fair value, with the unrealized gains and losses reported in stockholders' equity under the caption "Accumulated other comprehensive loss." Realized gains and losses, interest and dividends on available-for-sale securities are included in interest income and other, net. Available-for-sale securities are classified as current assets regardless of their maturity date if they are available for use in current operations. The Company reviews its investment portfolio to identify and evaluate investments that have indications of possible impairment. Factors considered in determining whether a loss is other-than-temporary include the length of time and extent to which fair value has been less than the cost basis, credit quality and the Company's ability and intent to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value. When a decline in fair value is determined to be other-than-temporary, unrealized losses on available-for-sale securities are charged against earnings. The specific identification method is used to determine the gains and losses on marketable securities.

For additional information on the Company's marketable securities, see Note 4 of Notes to the Consolidated Financial Statements.

F. Allowance for Doubtful Accounts:

The Company evaluates the collectability of accounts receivable based on a combination of factors. In the cases where the Company is aware of circumstances that may impair a specific customer's ability to meet its financial obligation, the Company records a specific allowance against amounts due, and thereby reduces the net recognized receivable to the amount management reasonably believes will be collected. For all other customers, the Company recognizes allowances for doubtful accounts based on the length of time the receivables are outstanding, industry and geographic concentrations, the current business environment and historical experience.

G. Inventories:

Inventories are stated at the lower of cost or market, with cost determined on a first-in, first-out basis, and include material, labor and manufacturing overhead costs. The Company reviews and sets standard costs as needed, but at a minimum on an annual basis, at current manufacturing costs in order to approximate actual costs.

The Company evaluates inventories for excess quantities and obsolescence. The Company establishes inventory reserves when conditions exist that suggest that inventory may be in excess of anticipated demand or is obsolete based upon assumptions about historical and future demand for the Company's products and market conditions. In addition, inventories are evaluated for potential obsolescence due to the effect of known and

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

anticipated engineering design changes. Once a reserve has been established, it is maintained until the item to which it relates is scrapped or sold.

H. Property, Plant and Equipment:

Property, plant and equipment are stated at cost. Depreciation of property, plant and equipment is computed using the straight-line method over the estimated useful lives of the assets which are fifteen years for buildings, four to seven years for machinery and equipment, seven years for furniture and fixtures, and three years for computer equipment. Leasehold improvements are amortized using the straight-line method over the lesser of the lease term or the estimated useful life of the related asset. Repairs and maintenance costs are expensed as incurred and major renewals and betterments are capitalized.

I. Impairment of Long-Lived Assets:

Long-lived assets, such as property, plant, and equipment, and identifiable acquired intangible assets with definite useful lives, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized by the amount by which the carrying amount of the asset exceeds the fair value of the asset, which is generally based on discounted cash flows.

J. Goodwill and Intangible Assets:

Intangible assets with finite useful lives are amortized using the straight-line method over their estimated useful lives. Goodwill and intangible assets with indefinite useful lives are not amortized but are tested for impairment at least annually and when there are indications of impairment. Goodwill impairment is deemed to exist if the net book value of a reporting unit exceeds its estimated fair value. The Company has the option to first assess qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If, the Company elects this option and after assessing the totality of events or circumstances, the Company determines that it is not likely that the fair value of its reporting unit is less than its carrying amount, then performing the two-step impairment test is unnecessary. The Company has not elected this option to date. The Company estimates the fair value of its reporting unit using the market value of its common stock at October 31 multiplied by the number of outstanding common shares (market capitalization) and an implied control premium as it were to be acquired by a single stockholder. The Company also obtains information on completed sales of similar companies in the related industry to estimate the implied control premium for the Company. If the results of the initial market capitalization test produce results which are below the reporting unit carrying value, the Company may also perform a discounted cash flow test. The Company tested for goodwill impairment on October 31, 2016. No impairments were noted.

For additional information on the Company’s goodwill and purchased intangible assets, see Note 5 of Notes to the Consolidated Financial Statements.

K. Concentration of Credit Risk:

Financial instruments, which potentially subject the Company to concentrations of credit risk, consist primarily of accounts receivable, cash and cash equivalents and marketable securities. The Company performs ongoing credit evaluations of its customers and generally does not require collateral for sales on credit. The Company maintains allowances for potential credit losses. The Company maintains cash and cash equivalents and marketable securities with higher credit quality issuers and monitors the amount of credit exposure to any one issuer.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

L. Warranties:
The Company generally provides a warranty on its products for a period of twelve to fifteen months against defects in material and workmanship. The Company provides for the estimated cost of product warranties at the time revenue is recognized.
M. Income Taxes:
The Company accounts for income taxes using the asset and liability approach for deferred taxes which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the Company's consolidated financial statements or tax returns. A valuation allowance is recorded to reduce a deferred tax asset to that portion which more likely than not will be realized. The Company does not provide for federal income taxes on the undistributed earnings of its foreign operations as it is the Company's intention to permanently re-invest undistributed earnings.
The impact of an uncertain income tax position is recognized as the largest amount that is more-likely-than-not to be sustained upon audit by the relevant taxing authority and includes consideration of interest and penalties. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained. The liability for unrecognized tax benefits is classified as non-current as the Company has early adopted the new ASU No. 2015-17 Balance Sheet Classification of Deferred Taxes to classify all deferred tax assets and liabilities as non-current.
For additional information on the Company's income taxes, see Note 11 of Notes to the Consolidated Financial Statements.
N. Translation of Foreign Currencies:
The Company has branch operations in Taiwan, Singapore and South Korea and wholly-owned subsidiaries in the United States, Europe, Japan and China. Its international subsidiaries and branches operate primarily using local functional currencies. A substantial portion of the Company's international systems sales are denominated in U.S. dollars with the exception of Japan and, as a result, it has relatively little exposure to foreign currency exchange risk with respect to these sales.
Assets and liabilities are translated at exchange rates in effect at the balance sheet date, and income and expense accounts and cash flow items are translated at average monthly exchange rates during the period. Net exchange gains or losses resulting from the translation of foreign financial statements and the effect of exchange rates on intercompany transactions of a long-term investment nature are recorded directly as a separate component of stockholders' equity under the caption, "Accumulated other comprehensive loss." Any foreign currency gains or losses related to transactions are included in operating results. The Company had accumulated exchange losses resulting from the translation of foreign operation financial statements of $2,742 and $2,623 as of December 31, 2016 and 2015, respectively.
O. Share-based Compensation:
The estimation of stock awards that will ultimately vest requires significant judgment. The Company considers many factors when estimating expected forfeitures, including types of awards, employee class, and historical experience. Actual results, and future changes in estimates, may differ substantially from the Company's current estimates.
Compensation expense for all share-based payments includes an estimate for forfeitures and is recognized over the expected term of the share-based awards using the straight-line method.
For additional information on the Company's share-based compensation plans, see Note 9 of Notes to the Consolidated Financial Statements.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

P. Research and Development and Software Development Costs:
Expenditures for research and development are expensed as incurred. Certain software product development costs incurred after technological feasibility has been established are capitalized and amortized, commencing upon the general release of the software product to the Company's customers, over the economic life of the software product. Annual amortization of capitalized costs is computed using the greater of: (i) the ratio of current gross revenues for the software product over the total of current and anticipated future gross revenues for the software product or (ii) the straight-line basis, typically over seven years. Software product development costs incurred prior to the product reaching technological feasibility are expensed as incurred and included in research and development costs. At December 31, 2016 and 2015, the Company did not have any capitalized software development costs.
Q. Shipping and Handling Costs:
Shipping and handling cost are included as a component of cost of revenues.
R. Fair Value of Financial Instruments:
The carrying amounts of the Company's financial instruments, including cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities, approximate fair value due to their short maturities. The estimated fair value of these obligations is based, primarily, on a market approach, comparing the Company's interest rates to those rates the Company believes it would reasonably receive upon re-entry into the market. Judgment is required to estimate the fair value, using available market information and appropriate valuation methods.
For additional information on the Company's fair value of financial instruments, see Note 3 of Notes to the Consolidated Financial Statements.
S. Derivative Instruments and Hedging Activities:
The Company, when it considers it to be appropriate, enters into forward contracts to hedge the economic exposures arising from foreign currency denominated transactions. At December 31, 2016 and 2015, these contracts included the future sale of Japanese Yen to purchase U.S. dollars. The foreign currency forward contracts were entered into by the Company's Japanese subsidiary to hedge a portion of certain intercompany obligations. The forward contracts are not designated as hedges for accounting purposes and therefore, the change in fair value is recorded in selling, general and administrative expenses in the Consolidated Statements of Operations. The Company records its forward contracts at fair value in either prepaid expenses and other current assets or other current liabilities in the Consolidated Balance Sheets.
The dollar equivalent of the U.S. dollar forward contracts and related fair values as of December 31, 2016 and 2015 were as follows:

	December 31,	
	2016	2015
Notional amount	$3,827	$5,423
Fair value of (liability) asset	$312	$(85)

In 2016, 2015 and 2014, the Company recognized gains of $417, $221 and $150 with respect to forward contracts that matured, respectively. The aggregate notional amount of matured contracts was $6,641, $2,484 and $1,456, for 2016, 2015 and 2014, respectively.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

T. Contingencies and Litigation

The Company is subject to the possibility of losses from various contingencies, including certain legal proceedings, lawsuits and other claims. The Company accrues for a loss contingency when it concludes that the likelihood of a loss is probable and the amount of the loss can be reasonably estimated. If the Company concludes that loss contingencies that could be material to any one of its financial statements are not probable, but are reasonably possible, or are probable, but cannot be estimated, then the Company discloses the nature of the loss contingencies, together with an estimate of the range of possible loss or a statement that such loss is not reasonably estimable. The Company expenses as incurred the costs of defending legal claims against the Company. The Company does not recognize gain contingencies until realized. See Note 8, “Commitments and Contingencies” for a detailed description.

U. Reclassifications:

Certain prior year amounts have been reclassified to conform to the 2016 financial statement presentation. These amounts include reclassification of a portion of deferred revenue to other non-current liabilities in the Consolidated Balance Sheets. In the first quarter of 2016, the Company adopted Accounting Standards Update (ASU) No. 2015-03, “Interest - Imputation of Interest (Subtopic 835-30), Simplifying the Presentation of Debt Issuance Costs,” which requires entities to present debt issuance costs related to a debt liability as a direct deduction from the carrying amount of that debt liability on the balance sheet as opposed to being presented as a deferred charge. Prior to adoption, the Company reported the unamortized debt issuance costs in “Other Assets” on the Consolidated Balance Sheets. As of December 31, 2015, the change in presentation resulted in a reduction of “Other Assets” of $261 and a corresponding decrease in “Convertible Senior Notes” with no impact on the Company’s Consolidated Statements of Operations. These reclassifications were not considered material to the prior year financial statements.

V. Recent Accounting Pronouncements:

In January 2017, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2017-04, “Intangibles - Goodwill and Other (Topic 350), ‘Simplifying the Test for Goodwill Impairment.” This ASU would eliminate Step 2 from the goodwill impairment test. The ASU is effective for the fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. The Company is currently evaluating the effect the adoption of ASU No. 2017-04 will have on its consolidated financial position, results of operations, and cash flows.

In October 2016, the FASB issued ASU No. 2016-16, “Income Tax (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory.” This ASU which is part of the Board’s simplification initiative, is intended to reduce the complexity of U.S. GAAP and diversity in practice related to the tax consequences of certain types of intra-entity asset transfers, particularly those involving intellectual property. This ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The Company is currently evaluating the effect the adoption of ASU No. 2016-16 will have on its consolidated financial position, results of operations, and cash flows.

In August 2016, the FASB issued ASU No. 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments.” This ASU provides guidance on statement of cash flows presentation for eight specific cash flow issues where diversity in practice exists. This ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The Company is currently evaluating the effect the adoption of ASU No. 2016-15 will have on its consolidated financial position, results of operations, and cash flows.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

In June 2016, the FASB issued ASU No. 2016-13, “Financial Instruments – Credit Losses (Topic 326),” which introduces new guidance for the accounting for credit losses on instruments within its scope. Given the breadth of that scope, the new ASU will impact both financial services and non-financial services entities. The standard is effective for fiscal years beginning after December 15, 2020. The Company is currently evaluating the effect the adoption of ASU No. 2016-13 will have on its consolidated financial position, results of operations, and cash flows.
In March 2016, the FASB issued ASU No. 2016-09, “Compensation - Stock Compensation (Topic 718), Improvements to Employee Share-Based Payment Accounting.” The standard was issued as part of the Simplification Initiative which involves several aspects of the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within annual periods beginning after December 15, 2016. The Company is currently evaluating the effect the adoption of ASU No. 2016-09 will have on its consolidated financial position, results of operations, and cash flows.
In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842).” The standard requires that lessees will be required to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with terms of more than 12 months. ASU No. 2016-02 also will require disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. These disclosures include qualitative and quantitative information. The standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018 with earlier adoption permitted. The Company is in the process of evaluating the effects the adoption of ASU No. 2016-02 will have on its consolidated financial position, results of operations, and cash flows.
In July 2015, the FASB issued ASU No. 2015-11, “Inventory (Topic 330), Simplifying the Measurement of Inventory.” This ASU is intended to simplify subsequent measurement of inventory. An entity should measure inventory within the scope of this ASU at the lower of cost and net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable cost of completion, disposal, and transportation. The standard is effective for annual periods and interim periods within those annual periods, beginning after December 15, 2016. The adoption of ASU 2015-11 is not expected to have a material effect on the Company's consolidated financial position, results of operations, and cash flows.
In May 2014, the FASB issued ASU No. 2014-09, “Revenue from Contracts with Customers (Topic 606).” ASU No. 2014-09, as amended, outlines a comprehensive revenue recognition model and supersedes most current revenue recognition guidance as amended. In July 2015, the FASB deferred for one year the effective date of the new revenue standard. The standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017 with earlier adoption permitted. ASU No. 2014-09 allows for two methods of adoption: (a) “full retrospective” adoption, meaning the standard is applied to all periods presented, or (b) “modified retrospective” adoption, meaning the cumulative effect of applying ASU No. 2014-09 is recognized as an adjustment to the 2018 opening retained earnings balance. The Company is in the process of determining the adoption method as well as the effects the adoption of ASU No. 2014-09 will have on its consolidated financial position, results of operations, and cash flows.

3. Fair Value Measurements:
The Company applies a three-level valuation hierarchy for fair value measurements. This hierarchy prioritizes the inputs into three broad levels. Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities. Level 2 inputs are quoted prices for similar assets and liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

substantially the full term of the asset or liability. Level 3 inputs are unobservable inputs based on management's assumptions used to measure assets and liabilities at fair value. A financial asset's or liability's fair value measurement classification within the hierarchy is determined based on the lowest level input that is significant to the fair value measurement.

The following tables provide the assets and liabilities carried at fair value measured on a recurring basis at December 31, 2016 and December 31, 2015:

	Fair Value Measurements Using			
	Carrying Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
December 31, 2016				
Assets:				
Available-for-sale debt securities:				
Municipal notes and bonds	$87,029	$ —	$ 87,029	$ —
Corporate bonds	843	—	843	—
Foreign currency forward contracts	312	—	312	—
Total Assets	$88,184	$ —	$ 88,184	$ —
Liabilities:				
Contingent consideration - acquisitions	3,251	—	—	3,251
Total Liabilities	$3,251	$ —	$ —	$ 3,251
December 31, 2015				
Assets:				
Available-for-sale debt securities:				
Municipal notes and bonds	$116,089	$ —	$ 116,089	$ —
Corporate bonds	835	—	835	—
Total Assets	$116,924	$ —	$ 116,924	$ —
Liabilities:				
Foreign currency forward contracts	$85	$ —	$ 85	$ —
Contingent consideration - acquisitions	3,703	—	—	3,703
Total Liabilities	$3,788	$ —	$ 85	$ 3,703

The Company's investments classified as Level 1 are based on quoted market prices that are available in active markets.

The Company's investments classified as Level 2 are valued using observable inputs to quoted market prices, benchmark yields, reported trades, broker/dealer quotes or alternative pricing sources with reasonable levels of price transparency. The foreign currency forward contracts are primarily measured based on the foreign currency spot and forward rates quoted by the banks or foreign currency dealers. Investment prices are obtained from third party pricing providers, which models prices utilizing the above observable inputs, for each asset class.

Level 3 investments consisted of contingent consideration related to an acquisition for which the Company uses a discounted cash flow model to value these investments. The Level 3 assumptions used in the discounted cash flow model for the contingent consideration included projected revenues, timing of cash flows and estimates of discount rates of 9.1% for the year ended December 31, 2016. A significant decrease in the projected revenues or increase in discount rates could result in a significantly lower fair value measurement for the contingent consideration.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

This table presents a reconciliation for all liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) for the year ended December 31, 2016:

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)
Liabilities:	
Balance at December 31, 2015	$ 3,703
Additions	—
Total loss due to remeasurement included in selling, general and administrative expense	170
Payments	(622)
Transfer into (out of) Level 3	—
Balance at December 31, 2016	$ 3,251

See Note 4 for additional discussion regarding the fair value of the Company's marketable securities.

Fair Value of Other Financial Instruments

The carrying value of cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximates fair value because of the short-term maturity of these instruments. The estimated fair value of these obligations is based, primarily, on a market approach, comparing the Company's interest rates to those rates the Company believes it would reasonably receive upon re-entry into the market. Judgment is required to estimate the fair value, using available market information and appropriate valuation methods.

The Company's convertible senior notes matured on July 15, 2016 and the principal payment amount of $60,000 was paid. As of December 31, 2016, there were no convertible senior notes outstanding. The Company's convertible senior notes were not publicly traded. The estimated fair value of the Company's convertible senior notes was valued using a discounted cash flow model. The Level 3 assumptions, based on data available at the valuation date used in preparing the discounted cash flow model, included estimates of interest rates, timing and amount of cash flows and expected holding periods of the convertible senior notes. The fair value of the contingent interest associated with the convertible senior notes was valued quarterly using the present value under an expected cash flow model incorporating the probabilities of the contingent events occurring.

The following table reflects information pertaining to the Company's convertible senior notes:

	December 31, 2015
Net carrying value of convertible senior notes	$ 57,846
Estimated fair value of convertible senior notes	$ 60,630
Estimated interest rate used in discounted cash flow model	5.0 %
Fair value of contingent interest	$ —

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

4. Marketable Securities:

The Company has evaluated its investment policies and determined that all of its investment securities are to be classified as available-for-sale. Available-for-sale securities are carried at fair value, with the unrealized gains and losses reported in Stockholders' Equity under the caption "Accumulated other comprehensive loss." Realized gains and losses on available-for-sale securities are included in "Other expense (income)." The Company records other-than-temporary impairment charges for its available-for-sale investments when it intends to sell the securities, it is more-likely-than not that it will be required to sell the securities before a recovery, or when it does not expect to recover the entire amortized cost basis of the securities. The cost of securities sold is based on the specific identification method.

The Company has determined that the gross unrealized losses on its marketable securities at December 31, 2016 and 2015 are temporary in nature. The Company reviews its investment portfolio to identify and evaluate investments that have indications of possible impairment. Factors considered in determining whether a loss is other-than-temporary include the length of time and extent to which fair value has been less than the cost basis, credit quality and the Company's ability and intent to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value.

At December 31, 2016 and 2015, marketable securities are categorized as follows:

	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Fair Value
December 31, 2016				
Municipal notes and bonds	$87,088	$ 6	$ (65)	$87,029
Corporate bonds	842	1	—	843
Total marketable securities	$87,930	$ 7	$ (65)	$87,872
December 31, 2015				
Municipal notes and bonds	$116,086	$ 18	$ (15)	$116,089
Corporate bonds	838	—	(3)	835
Total marketable securities	$116,924	$ 18	$ (18)	$116,924

The amortized cost and estimated fair value of marketable securities classified by the maturity date listed on the security, regardless of the Consolidated Balance Sheet classification, is as follows at December 31, 2016 and 2015:

	December 31, 2016		December 31, 2015	
	Amortized Cost	Fair Value	Amortized Cost	Fair Value
Due within one year	$82,498	$82,445	$113,542	$113,549
Due after one through five years	5,431	5,427	3,382	3,375
Due after five through ten years	—	—	—	—
Due after ten years	—	—	—	—
Total marketable securities	$87,929	$87,872	$116,924	$116,924

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The following table summarizes the estimated fair value and gross unrealized holding losses of marketable securities, aggregated by investment instrument and period of time in an unrealized loss position at December 31, 2016 and 2015.

	In Unrealized Loss Position For Less Than 12 Months		In Unrealized Loss Position For Greater Than 12 Months	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
December 31, 2016				
Municipal notes and bonds	$64,918	$ (65)	$—	$ —
Corporate bonds	—	—	—	—
Total marketable securities	$64,918	$ (65)	$—	$ —
December 31, 2015				
Municipal notes and bonds	$52,638	$ (15)	$305	$ (1)
Corporate bonds	835	(3)	—	—
Total marketable securities	$53,473	$ (18)	$305	$ (1)

See Note 3 for additional discussion regarding the fair value of the Company's marketable securities.

5. Goodwill and Purchased Intangible Assets:

Goodwill

There were no changes in the carrying amount of goodwill for the years ended December 31, 2016 and 2015.

Purchased Intangible Assets

Purchased intangible assets as of December 31, 2016 and 2015 are as follows:

	Gross Carrying Amount	Accumulated Amortization	Net
December 31, 2016			
Finite-lived intangibles:			
Developed technology	$65,527	$ 56,986	$8,541
Customer and distributor relationships	9,560	8,514	1,046
Trade names	4,361	3,675	686
Total identifiable intangible assets	$79,448	$ 69,175	$10,273
December 31, 2015			
Finite-lived intangibles:			
Developed technology	$65,527	$ 55,110	$10,417
Customer and distributor relationships	9,560	8,170	1,390
Trade names	4,361	3,575	786
Total identifiable intangible assets	$79,448	$ 66,855	$12,593

Intangible asset amortization expense amounted to $2,320, $2,145 and $2,422 for the years ended December 31, 2016, 2015 and 2014, respectively. Assuming no change in the gross carrying value of identifiable intangible assets and

estimated lives, estimated amortization expense will be $1,933 for 2017, $1,496 for 2018, $1,496 for 2019, $1,294 for 2020, and $546 for 2021.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

In September 2015, the Company announced that it purchased Stella Alliance, LLC, a Massachusetts-based semiconductor inspection technology intellectual property portfolio company. The acquired intellectual property was integrated into the Company's process control group. The Company accounted for the transaction as an asset acquisition and assigned a fair value to the intellectual property of $5,696, which is included in the asset class of developed technology. The intellectual property is being amortized on a straight line basis over its estimated useful life of fifteen years.

6. Balance Sheet Details:

Inventories

Inventories are comprised of the following:

	December 31,	
	2016	2015
Materials	$32,993	$39,022
Work-in-process	18,764	18,918
Finished goods	13,728	13,550
Total inventories	$65,485	$71,490

The Company has established reserves of $10,545 and $8,896 at December 31, 2016 and 2015, respectively, for slow moving and obsolete inventory. During 2016, the Company recorded a net charge in cost of revenues of $2,953 for the write-down of inventory for excess parts, for older product lines and for parts that were rendered obsolete by design and engineering advancements. In 2016, the Company disposed of $1,304 of inventory. During 2015, the Company recorded a net charge in cost of revenues of $3,676 for the write-down of inventory for excess parts, for older product lines and for parts that were rendered obsolete by design and engineering advancements. In 2015, the Company disposed of $1,780 of inventory.

Property, Plant and Equipment

Property, plant and equipment, net is comprised of the following:

	December 31,	
	2016	2015
Land and building	$2,584	$5,024
Machinery and equipment	23,493	21,683
Furniture and fixtures	2,699	3,414
Computer equipment and software	5,204	5,304
Leasehold improvements	8,116	7,884
	42,096	43,309
Accumulated depreciation	(30,238)	(30,963)
Total property, plant and equipment, net	$11,858	$12,346

Depreciation expense amounted to $3,677, $3,951 and $4,686 for the years ended December 31, 2016, 2015 and 2014, respectively.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

Other current liabilities
Other current liabilities is comprised of the following:

	December 31,	
	2016	2015
Intangible asset acquisition - Stella Alliance	$1,000	$2,000
Litigation accrual	—	3,252
Contingent consideration - acquisitions	855	1,407
Warrant settlement payable	1,025	—
Customer deposits	996	505
Other	3,263	5,251
Total other current liabilities	$7,139	$12,415

Other non-current liabilities
Other non-current liabilities is comprised of the following:

	December 31,	
	2016	2015
Unrecognized tax benefits (including interest)	$3,386	$3,152
Contingent consideration - acquisitions	2,396	2,296
Deferred revenue	1,132	1,206
Other	2,088	2,900
Total non-current liabilities	$9,002	$9,554

7. Debt Obligations:
On July 25, 2011, the Company issued $60,000 aggregate principal amount of 3.75% Convertible Senior Notes due 2016 (the “Notes”) at par. The Notes were issued pursuant to an indenture, dated as of July 25, 2011, between the Company and Bank of New York Mellon Trust Company, N.A., as Trustee, which includes a form of Note. The Notes provided for the payment of interest semi-annually in arrears on January 15 and July 15 of each year, beginning January 15, 2012, at an annual rate of 3.75%. Concurrently with the issuance of the Notes, the Company purchased a convertible note hedge and sold a warrant. Each of the convertible note hedge and warrant transactions were entered into with an affiliate of the initial purchaser of the Notes.
On July 15, 2016, the Company redeemed all of its outstanding 3.75% Convertible Senior Notes with an aggregate principle amount of $60,000. Under the terms of the indenture, holders of the Notes were paid cash up to the aggregate principal amount of the notes and were issued shares of common stock for the remainder of the conversion, with any fractional shares paid in cash. The conversion resulted in the issuance of 540 shares of common stock of the Company to the bondholders, but resulted in no dilution to Rudolph shareholders as these shares were covered by the convertible note hedge that was entered into by the Company in 2011 at the time of issuance of the notes.
The sale of the warrant gave the holder the right to purchase 4,634 shares of the Company’s common stock at a strike price of $17.00 per share. The warrant has a series of daily expiration dates beginning in October 2016 and ending in January 2017. From October 13, 2016 to December 31, 2016, the holder exercised 4,248 warrants, which settled for 80 shares of the Company’s common stock and $10,525 payable in cash, of which $9,500 was

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

paid as of December 31, 2016, at a weighted average stock price of $19.82 per share. The remaining 386 warrants were exercised in January 2017 by the holder for 102 shares of the Company's common stock at a weighted average stock price of $23.13 per share.

The following table reflects the net carrying value of the Notes as of December 31, 2016 and 2015:

	December 31, 2016	December 31, 2015
Convertible senior notes	$—	$60,000
Less: Unamortized interest discount	—	1,893
Less: Unamortized debt issuance costs	—	261
Net carrying value of convertible senior notes	$—	$57,846

The following table presents the amount of interest cost recognized relating to the Notes during the years ended December 31, 2016, 2015 and 2014.

	December 31,		
	2016	2015	2014
Contractual interest coupon	$1,186	$2,250	$2,250
Amortization of interest discount	1,893	3,334	3,022
Amortization of debt issuance costs	261	432	363
Total interest cost recognized	$3,340	$6,016	$5,635

8. Commitments and Contingencies:

Intellectual Property Indemnification Obligations

The Company has entered into agreements with customers that include limited intellectual property indemnification obligations that are customary in the industry. These guarantees generally require the Company to compensate the other party for certain damages and costs incurred as a result of third party intellectual property claims arising from these transactions. The nature of the intellectual property indemnification obligations prevents the Company from making a reasonable estimate of the maximum potential amount it could be required to pay to its customers. Historically, the Company has not made any indemnification payments under such agreements and no amount has been accrued in the accompanying consolidated financial statements with respect to these indemnification guarantees.

Warranty Reserves

The Company generally provides a warranty on its products for a period of twelve to fifteen months against defects in material and workmanship. The Company estimates the costs that may be incurred during the warranty period and records a liability in the amount of such costs at the time revenue is recognized. The Company's estimate is based primarily on historical experience. The Company periodically assesses the adequacy of its recorded warranty liabilities and adjusts the amounts as necessary. Settlements of warranty reserves are generally associated with sales that occurred during the 12 to 15 months prior to the year-end and warranty accruals are related to sales during the year.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

Changes in the Company's warranty reserves are as follows:

	Year Ended December 31,		
	2016	2015	2014
Balance, beginning of the year	$1,894	$1,574	$1,551
Accruals	2,405	2,640	2,048
Usage	(2,511)	(2,320)	(2,025)
Balance, end of the year	$1,788	$1,894	$1,574

Legal Matters

From time to time, the Company is subject to legal proceedings and claims in the ordinary course of business. The following reflects an overview of the material activities with regard to these matters through December 31, 2016.

Integrated Technology Corporation v. Rudolph Technologies, Inc., No. CV-06-2182 (PHX-ROS): The sole remaining issue in this case was the determination and payment of remanded attorney's fees which were initially set by the U.S. District Court for the District of Arizona (the "AZ District Court") at $3,252. Subsequent to the Company's successful appeal before the U.S. Federal Court of Appeals, the matter was remanded back to the AZ District Court for a determination of a proper fee award. On October 5, 2016, the AZ District Court issued an order determining that the Company is to pay $1,289 to ITC for its attorney's fees. The payment was made in November of 2016 and this matter is now closed.

August Technology Corporation and Rudolph Technologies, Inc. v. Camtek, Ltd., No. 05-CV-01396 (JRT/FLN): Subsequent to the ruling by the U.S. District Court for the District of Minnesota (the "MN District Court") in the Company's favor that Camtek's Falcon tools continue to infringe the Company's patent under the revised claim construction of the patent determined by the Court of Appeals, the MN District Court, on February 9, 2015, issued an Order granting the Company's Motion for Final Judgment, reinstating the original damages and applying prejudgment interest for a total award of $14,512. In addition, the MN District Court issued a permanent injunction against Camtek from "making, using, selling and offering to sell any of its Falcon machines and any machines that are colorable imitations thereof in the United States, intended for sale and use within the United States, until the expiration of the '6,298 patent," which is projected to be in 2020. While, in March of 2015, Camtek filed an appeal with the Court of Appeals challenging the MN District Court's ruling, the Court of Appeals denied Camtek's appeal on February 3, 2016, affirming both the infringement ruling and the damages and interest totaling approximately $14,632 assessed against Camtek by the MN District Court, the payment of which is guaranteed by a supersedeas bond. All of Camtek's rights to appeal the final judgment have expired. On July 22, 2016, the MN District Court ordered that the full amount of the judgment be paid to the Company. With the payment of the final judgment amount on August 11, 2016, this matter has been closed.

August Technology Corporation and Rudolph Technologies, Inc. v. Camtek, Ltd., No. 11-CV-03707 (MJD/TNL): A lawsuit against Camtek, Ltd., of Migdal Hamek, Israel, was filed by the Company in 2011 alleging infringement of its U.S. Patent No. 7,729,528 related to its proprietary continuous scan wafer inspection technology. Camtek filed an inter partes reexamination petition with the U.S. Patent and Trademark Office (the "PTO") on January 19, 2012 asserting that certain claims of the patent are unpatentable. In the course of this proceeding the PTO issued a final determination that 35 claims of the patent were valid and 18 claims were rejected. The Company appealed the PTO's rejection of the 18 claims to the US. Court of Appeals. On December 22, 2016, the U.S. Court of Appeals for the Federal Circuit reversed the PTO's rejection of three of the 18 patent claims and affirmed the PTO's rejection of nine of

the 18 patent claims. The appeal of the remaining six patent claims was dismissed for procedural reasons. Thus, 38 claims are available to be asserted under the ‘528 patent in this lawsuit. During the

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

pendency of the reexamination process, the parties have stipulated that the lawsuit be stayed. With resolution of Camtek's petition, it is intended to lift the stay in the lawsuit in Q1 2017.

Rudolph Technologies, Inc. v. Camtek, Ltd., No. 15-CV-1246 (ADM/BRT): On March 12, 2015, the Company filed and served on Camtek a complaint asserting infringement of Rudolph's U.S. Patent No. 6,826,298 by Camtek's Eagle product with the U.S. District Court in Minnesota. The '6,298 patent is also related to our proprietary continuous scan wafer inspection technology and was the subject of Rudolph's prior litigation against the Camtek Falcon system (the "Falcon Litigation") in which Rudolph prevailed with a final judgment of infringement and damages of $14,600 assessed against Camtek. On April 21, 2015, the Company filed a Motion for Preliminary Injunction to enjoin Camtek's sale of the Eagle device in the United States. On or about April 20, 2015, Camtek filed a complaint in the U.S. District Court in New Jersey seeking a declaratory judgment challenging the jurisdiction and venue of the Minnesota District Court and seeking to have the New Jersey District Court find that the '6,298 patent is not infringed and, in the alternative, that the '6,298 patent is invalid. On August 26, 2015, the U.S. District Court in Minnesota ruled that Minnesota jurisdiction was appropriate for this matter while at the same time denying the Company's Motion for Preliminary Injunction. Camtek's complaint filed in the U.S. District Court in New Jersey was subsequently dismissed. On August 8, 2016 the Minnesota District Court issued an order regarding motions for partial summary judgment which we had filed in March of 2016 granting (i) that the '6,298 patent is valid and Camtek is precluded from contesting its validity at trial, and (ii) that the claim constructions adopted in the Falcon Litigation for four terms are entitled to a preclusive effect and will apply in the course of the present litigation. The Minnesota District Court also ruled that three phrases not subject to claim construction in the Falcon Litigation may be defined in the present case. This matter is currently ongoing in the U.S. District Court in Minnesota with no trial date set.

Lease Agreements

The Company rents space for its manufacturing and service operations and sales offices, which expire through 2020. Total rent expense for these facilities amounted to $3,296, $3,525 and $3,716 for the years ended December 31, 2016, 2015 and 2014, respectively.

The Company also leases certain equipment pursuant to operating leases, which expire through 2020. Rent expense related to these leases amounted to $99, $105 and $95 for the years ended December 31, 2016, 2015 and 2014, respectively.

Total future minimum lease payments under noncancelable operating leases as of December 31, 2016 amounted to $2,922 for 2017, $2,621 for 2018, $1,780 for 2019, $1,010 for 2020, $541 for 2021 and $772 for all periods thereafter.

Royalty Agreements

Under various licensing agreements, the Company is obligated to pay royalties based on net sales of products sold. There are no minimum annual royalty payments. Royalty expense amounted to $586, $813 and $819 for the years ended December 31, 2016, 2015 and 2014, respectively.

Open and Committed Purchase Orders

The Company has open and committed purchase orders of $19,296 as of December 31, 2016.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

Line of Credit

The Company has a credit agreement with a bank that provides for a line of credit which is secured by the marketable securities the Company has with the bank. The Company is permitted to borrow up to 70% of the value of eligible securities held at the time the line of credit is accessed. The available line of credit as of December 31, 2016 was approximately $68,327. The Company entered into our current credit agrement and concurrently terminated a prior credit agreement in June 2016. The credit agreement is available to the Company until such time that either party terminates the arrangement at their discretion. The Company has not utilized the line of credit to date.

9. Share-Based Compensation and Employee Benefit Plans:

Share-Based Compensation Plans

The Company's share-based compensation plans are intended to attract and retain employees and to provide an incentive for them to assist the Company to achieve long-range performance goals and to enable them to participate in long-term growth of the Company. The Company settles stock option exercises and restricted stock unit awards with newly issued common shares.

The Company established the 2009 Stock Plan (the "2009 Plan") effective November 1, 2009. The 2009 Plan provides for the grant of 3,300 stock options and other stock awards to employees, directors and consultants at an exercise price equal to or greater than the fair market value of the common stock on the date of grant. Shares of common stock available for future grants of 2,558 from a previous stock plan were carried forward into the allocated balance of the 2009 Plan. Options granted under the 2009 Plan typically grade vest over a five-year period and expire ten years from the date of grant. Restricted stock units granted under the 2009 Plan typically vest over a five-year period for employees and one year for directors, however, other vesting periods are allowable under the 2009 Plan. Restricted stock units granted to employees have time based or performance based vesting. As of December 31, 2016 and 2015, there were shares of common stock available for issuance pursuant to future grants under the 2009 Plan totaling 2,247 and 2,626, respectively.

The following table reflects share-based compensation expense by type of award:

	Year Ended December 31,		
	2016	2015	2014
Share-based compensation expense:			
Stock options	$318	$287	$320
Restricted stock units	4,457	7,316	5,922
Total share-based compensation	4,775	7,603	6,242
Tax effect on share-based compensation	1,743	2,767	2,263
Net effect on net income	$3,032	$4,836	$3,979
Effect on earnings per share:			
Basic	$(0.10)	$(0.15)	$(0.12)
Diluted	$(0.10)	$(0.15)	$(0.12)

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

Stock Option Activity
A summary of the Company's stock option activity with respect to the years ended December 31, 2014, 2015 and 2016 follows:

	Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at December 31, 2013	970	$ 13.94		
Granted	—	—		
Exercised	(25)	6.86		
Expired	(320)	21.51		
Forfeited	(10)	8.30		
Outstanding at December 31, 2014	615	10.39		
Granted	—	—		
Exercised	(25)	8.19		
Expired	(100)	15.56		
Forfeited	—	—		
Outstanding at December 31, 2015	490	9.46		
Granted	—	—		
Exercised	(231)	7.76		
Expired	(44)	14.74		
Forfeited	—	—		
Outstanding at December 31, 2016	215	$ 10.19	4.6	$ 2,823
Vested or expected to vest at December 31, 2016	213	$ 10.17	4.6	$ 2,805
Exercisable at December 31, 2016	180	$ 9.79	4.4	$ 2,434

The total intrinsic value of the stock options exercised during 2016, 2015 and 2014 was $1,312, $108 and $101, respectively.
The options outstanding and exercisable at December 31, 2016 were in the following exercise price ranges:

	Options Outstanding			Options Exercisable	
Range of Exercise Prices	Shares	Weighted Average Remaining Contractual Life (years)	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
6.80 - 6.80	74	2.6	$ 6.80	74	$ 6.80
7.86 - 7.86	8	1.4	$ 7.86	8	$ 7.86
12.22 - 12.22	133	5.9	$ 12.22	98	$ 12.22
6.80 - 12.22	215	4.6	$ 10.19	180	$ 9.79

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

As of December 31, 2016, there was $229 of total unrecognized compensation cost related to stock options granted under the plans. That cost is expected to be recognized over a weighted average remaining period of 1.0 years.

Non-Employee Options

At December 31, 2016 and 2015, the fair value of options granted to non-employees was $270 and $198, respectively.

Restricted Stock Unit Activity

A summary of the Company's restricted stock unit activity with respect to the years ended December 31, 2014, 2015 and 2016 follows:

	Number of Shares	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2013	1,116	$ 9.73
Granted	631	$ 10.89
Vested	(836)	$ 9.20
Forfeited	(106)	$ 10.57
Nonvested at December 31, 2014	805	$ 11.07
Granted	967	$ 10.99
Vested	(563)	$ 10.25
Forfeited	(40)	$ 11.05
Nonvested at December 31, 2015	1,169	$ 11.40
Granted	429	$ 13.20
Vested	(413)	$ 10.80
Forfeited	(49)	$ 11.14
Nonvested at December 31, 2016	1,136	$ 12.30

As of December 31, 2016, there was $8,697 of total unrecognized compensation cost related to restricted stock units granted under the plans. That cost is expected to be recognized over a weighted average period of 2.7 years.

Non-Employee Restricted Stock Units

At December 31, 2016 and 2015, the fair value of options granted to non-employees was $0 and $43, respectively.

Employee Stock Purchase Plan

The Company established an Employee Stock Purchase Plan (the "ESPP") effective November 1, 2009. Under the terms of the ESPP, eligible employees may have up to 15% of eligible compensation deducted from their pay and applied to the purchase of shares of Company common stock. The price the employee must pay for each share of stock will be 95% of the fair market value of Company common stock at the end of the applicable six-month purchase period. The ESPP is intended to qualify under Section 423 of the Internal Revenue Code and is a non-compensatory plan as defined by FASB Accounting Standards Codification ("ASC") 718, Stock Compensation. No stock-based compensation expense for the ESPP was recorded for the years ended December 31,

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

2016, 2015 and 2014. Employees purchased 15, 16 and 22 shares during the twelve months ended December 31, 2016, 2015 and 2014, respectively, under the ESPP. As of December 31, 2016 and 2015, there were 1,962 and 1,677 shares available for issuance under the ESPP, respectively.

401(k) Savings Plan

The Company has a 401(k) savings plan that allows employees to contribute up to 100% of their annual compensation to the Plan on a pre-tax or after tax basis, limited to a maximum annual amount as set periodically by the Internal Revenue Service. The plan provides a 50% match of all employee contributions up to 6 percent of the employee's salary. Company matching contributions to the plan totaled $1,017, $963 and $966 for the years ended December 31, 2016, 2015 and 2014, respectively.

Profit Sharing Program

The Company has a profit sharing program, wherein a percentage of pre-tax profits, at the discretion of the Board of Directors, is provided to all employees who have completed a stipulated employment period. The Company did not make contributions to this program for the years ended December 31, 2016, 2015 and 2014.

10. Other (Income) Expense:

Other expense (income) is comprised of the following:

	Year Ended December 31,		
	2016	2015	2014
Foreign currency exchange losses (gains), net	$592	$293	$ 65
Gain on sale of property, plant and equipment	(946)	—	—
Total other (income) expense	$(354)	$293	$ 65

11. Income Taxes:

The components of income tax expense (benefit) are as follows:

	Year Ended December 31,		
	2016	2015	2014
Current:			
Federal	$6,084	$1,012	$(124)
State	983	439	198
Foreign	838	3,425	1,812
	7,905	4,876	1,886
Deferred:			
Federal	4,765	3,881	(4,285)
State	184	71	54
Foreign	62	28	294
	5,011	3,980	(3,937)
Total income tax expense (benefit)	$12,916	$8,856	$(2,051)

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The income (loss) before tax are comprised of the following:

	Year Ended December 31,		
	2016	2015	2014
Domestic operations	$47,599	$10,596	$(11,985)
Foreign operations	$2,269	$16,216	$5,294

The provision for income taxes differs from the amount of income tax determined by applying the applicable U.S. federal income tax rate of 35% for the years ended December 31, 2016, 2015 and 2014 to income before provision for income taxes as follows:

	Year Ended December 31,		
	2016	2015	2014
Federal income tax provision at statutory rate	$17,454	$9,384	$(2,342)
State taxes, net of federal effect	822	370	21
Foreign taxes net of federal effect	(1,613)	754	561
Domestic manufacturing benefit	(1,244)	(553)	—
Change in valuation allowance for deferred tax assets	—	(653)	535
Research tax credit	(692)	(694)	(830)
Deferred tax true-up	(1,644)	(23)	(36)
Other	(167)	271	40
Provision (benefit) for income taxes	$12,916	$8,856	$(2,051)
Effective tax rate	26%	33%	31%

The income tax expense of $12,916 in 2016, was impacted by research and development credits, section 199 domestic manufacturing deduction, the foreign tax credit and deferred tax true-ups. The deferred tax true-up of $1,705 is related to a non-cash out of period tax benefit recorded by the Company as of December 31, 2016 related to deferred tax assets misstated from prior years. The recording of the tax benefit due to the out of period adjustment in 2016 was not considered material to the prior year or current year financial statements. The income tax expense of $8,856 in 2015, was impacted by an increase in the Company’s taxes accrued in foreign jurisdictions, partially offset by research and development credits, section 199 domestic manufacturing deduction and decrease in the Company’s valuation allowance. The income tax benefit of $2,051 in 2014, was impacted by an increase in the Company’s valuation allowance and taxes accrued in foreign jurisdictions, partially offset by research and development tax credit.
The Company’s future effective income tax rate depends on various factors, such as tax legislation, the geographic composition of our pre-tax income, the amount of our pre-tax income as business activities fluctuate, non-deductible expenses incurred in connection with acquisitions, research and development credits as a percentage of aggregate pre-tax income and the domestic manufacturing deduction.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

Deferred tax assets and liabilities are comprised of the following:

	December 31,	
	2016	2015
Research and development credit carryforward	$3,784	$6,647
Reserves and accruals not currently deductible	2,932	3,357
Deferred revenue	2,286	1,988
Domestic net operating loss carryforwards	1,049	1,302
Foreign net operating loss and credit carryforwards	4,362	4,347
Intangibles	11,002	11,614
Tax deductible transaction costs	199	260
Share-based compensation	2,249	3,396
Inventory obsolescence reserve	4,454	4,026
Depreciation	206	484
Other	633	87
Gross deferred tax assets	33,156	37,508
Valuation allowance for deferred tax assets	(1,924)	(2,205)
Deferred tax assets after valuation allowance	31,232	35,303
Gross deferred tax liabilities	(382)	(330)
Net deferred tax assets	$30,850	$34,973

At December 31, 2016 and 2015, the Company had valuation allowances of $1,924 and $2,205, respectively, on certain of the Company’s deferred tax assets to reflect the deferred tax assets at the net amount that is more likely than not to be realized.

In assessing the realizability of deferred tax assets, the Company uses a more likely than not standard. If it is determined that it is more-likely-than-not that deferred tax assets will not be realized, a valuation allowance must be established against the deferred tax assets. The ultimate realization of the assets is dependent on the generation of future taxable income during the periods in which the associated temporary differences become deductible. Management considers the scheduled reversal of deferred income tax liabilities, projected future taxable income and tax planning strategies when making this assessment. In making the determination that it is more likely than not that the Company’s deferred tax assets will be realized as of December 31, 2016, the Company relied primarily on projected future taxable income.

At December 31, 2016, the Company had federal, state and foreign net operating loss carryforwards of $747, $172 and $1,001, respectively. In addition, as of December 31, 2016 the Company had federal AMT carryforwards of $130. The federal, state and foreign net operating loss carryforwards expire on various dates through December 31, 2032, December 31, 2032 and December 31, 2025, respectively. At December 31, 2016, the Company had federal and state research & development credits and foreign tax credit carryforwards of $3,767, $1,459 and $3,330, respectively. The federal research & development credits are set to expire at various dates through December 31, 2036. The state research & development credits are set to expire at various dates through December 21, 2024. The foreign tax credit is set to expire at various dates through December 31, 2026.

A provision has not been made at December 31, 2016 for U.S. or additional foreign withholding taxes on approximately $6,958 of undistributed earnings of the Company’s foreign subsidiaries in Europe and Japan because it is the present intention of management to permanently reinvest these undistributed earnings. It is not practical to estimate the amount of tax that might be payable if some or all of such earnings were to be remitted.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The total amount of unrecognized tax benefits were as follows:

	December 31,		
	2016	2015	2014
Unrecognized tax benefits, opening balance	$5,236	$5,292	$5,706
Gross increases—tax positions in prior period	118	136	150
Gross decreases—tax positions in prior period	(735)	(755)	(892)
Gross increases—current-period tax positions	208	563	328
Lapse of statute of limitations	—	—	—
Unrecognized tax benefits, ending balance	$4,827	$5,236	$5,292

Included in the ending balance at December 31, 2016 and 2015 are unrecognized tax benefits of $4,275 and $4,613, respectively, which would be reflected as an adjustment to income tax expense if recognized. The year over year decrease from 2014 to 2016 is primarily due to the reversal of unrecognized tax benefits related to federal tax exposures. It is reasonably possible that certain amounts of unrecognized tax benefits may reverse in the next 12 months; however, the Company does not expect such reversals would have a significant impact on its results of operations or financial position.

The Company recognizes accrued interest and penalties related to unrecognized tax benefits in income tax expense. During the years ended December 31, 2016, 2015 and 2014, the Company recognized approximately $76, $71 and $60, respectively, in interest and penalties expense associated with uncertain tax positions. As of December 31, 2016 and 2015, the Company had accrued interest and penalties expense related to unrecognized tax benefits of $1,019 and $900, respectively.

The Company is subject to U.S. federal income tax as well as income tax in multiple state and foreign jurisdictions. The Company files U.S. federal, U.S. state and foreign tax returns. For U.S. federal purposes, the Company is generally no longer subject to tax examinations for years prior to 2012. For U.S. state tax returns, the Company is generally no longer subject to tax examinations for years prior to 2011. For foreign purposes, the Company is generally no longer subject to examination for tax periods 2011 and prior. Certain carryforward tax attributes generated in prior years remain subject to examination and adjustment. The Company believes that adequate amounts have been reserved for any adjustments that may ultimately result from any future examinations of these years.

In the normal course of business, the Company is subject to tax audits in various jurisdictions, and such jurisdictions may assess additional income or other taxes against it. Although the Company believes its tax estimates are reasonable, the final determination of tax audits and any related litigation could be materially different from the Company’ s historical income tax provisions and accruals. The results of an audit or litigation could have a material adverse effect on the Company’ s results of operations or cash flows in the period or periods for which that determination is made.

12. Accumulated Other Comprehensive Loss:

Comprehensive income includes net income, foreign currency translation adjustments, and net unrealized gains and losses on available-for-sale investments. See the Consolidated Statements of Comprehensive Income for the effect of the components of comprehensive income to our net income.

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The components of accumulated other comprehensive loss, net of tax, are as follows:

	Foreign currency translation adjustments	Net unrealized losses on available-for-sale investments	Accumulated other comprehensive loss
Beginning Balance, December 31, 2014	$ 2,685	$ (33)	$ 2,652
Net current period other comprehensive loss	(62)	33	(29)
Reclassifications	—	—	—
Beginning Balance, December 31, 2015	$ 2,623	$ —	$ 2,623
Net current period other comprehensive loss	119	37	156
Reclassifications	—	—	—
Ending balance, December 31, 2016	$ 2,742	$ 37	$ 2,779

13. Segment Reporting and Geographic Information:

The Company is engaged in the design, development, manufacture and support of process control defect inspection and metrology, advanced packaging lithography and data analysis systems and software used by microelectronics device manufacturers. The Company and its subsidiaries currently operate in a single operating segment: the design, development, manufacture and support of process control defect inspection and metrology, advanced packaging lithography, and data analysis systems and software used by microelectronics device manufacturers, and therefore have one reportable segment. The Company's chief operating decision maker is the Chief Executive Officer. The chief operating decision maker allocates resources and assesses performance of the business and other activities at the reportable segment level.

The following table lists the different sources of revenue:

	Year Ended December 31,								
	2016			2015			2014		
Systems and software:									
Process Control	$146,652	63	%	$144,858	66	%	$112,408	63	%
Lithography	18,949	8	%	14,519	6	%	11,163	6	%
Software	29,795	13	%	27,291	12	%	24,042	13	%
Parts	25,343	11	%	24,072	11	%	20,334	11	%
Services	12,041	5	%	10,950	5	%	13,271	7	%
Total revenue	$232,780	100	%	$221,690	100	%	$181,218	100	%

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The Company's significant operations outside the United States include sales, service and application offices in Europe and Asia. For geographical reporting, revenues are attributed to the geographic location in which the product is shipped. Revenue by geographic region is as follows:

	Year Ended December 31,		
	2016	2015	2014
Revenues from third parties:			
United States	$30,876	$46,778	$56,963
Taiwan	68,211	55,548	49,532
South Korea	15,556	14,221	16,690
Singapore	35,517	27,310	14,551
Austria	2,049	3,557	752
Japan	11,875	13,216	9,449
Germany	9,759	29,378	9,142
China	33,720	17,152	11,521
Other Europe	18,720	11,403	9,362
Other Asia	6,497	3,127	3,256
Total revenue	$232,780	$221,690	$181,218

No individual end user customer accounted for more than 10% of the Company's revenue in 2016, 2015 and 2014. The Company does not have purchase contracts with any of its customers that obligate them to continue to purchase its products.
At December 31, 2016 and December 31, 2015, one customer, Taiwan Semiconductor Manufacturing Co. Ltd., accounted for more than 10% of net accounts receivable.
Substantially all of the Company's long-lived assets are located within the United States of America.

14. Earnings (Loss) Per Share:
Basic earnings (loss) per share is calculated using the weighted average number of shares of common stock outstanding during the period. Diluted earnings per share is computed in the same manner and also gives effect to all dilutive common equivalent shares outstanding during the period. Potential common shares that would have the effect of increasing diluted earnings per share are considered to be antidilutive. In accordance with U.S. GAAP, these shares were not included in calculating diluted earnings per share.
For the year ended December 31, 2016, the weighted average number of stock options and restricted stock units excluded from the computation of diluted earnings per share were 39 and 0, respectively. For the year ended December 31, 2015, the weighted average number of stock options and restricted stock units excluded from the computation of diluted earnings per share were 15 and 190, respectively. For the year ended December 31, 2014, all outstanding restricted stock units of 805 and stock options of 615 were excluded from the computation of diluted loss per shares because the effect in the period would be antidilutive.
For the years ended December 31, 2016 and 2015, diluted earnings per share-weighted average shares outstanding included the effect resulting from assumed conversion of the Notes and warrants. For the year ended December 31, 2014, diluted earnings per share-weighted average shares outstanding do not include any effect resulting from assumed conversion of the Notes as their impact would be anti-dilutive. See Note 7 for additional discussion regarding the Notes.

F-33

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

The computations of basic and diluted income per share for the years ended December 31, 2016, 2015, and 2014 are as follows:

	December 31,		
	2016	2015	2014
Numerator:			
Net income (loss)	$36,952	$17,956	$(4,640)
Denominator:			
Basic earnings per share - weighted average shares outstanding	31,128	31,408	33,124
Effect of potential diluted securities:			
Employee stock options and restricted stock units - dilutive shares	467	692	—
Convertible senior notes - dilutive shares	103	66	—
Warrants - dilutive shares	92	—	—
Diluted earnings per share - weighted average shares outstanding	31,790	32,166	33,124
Earnings per share:			
Basic	$1.19	$0.57	$(0.14)
Diluted	$1.16	$0.56	$(0.14)

15. Shares Repurchase Authorization:

In January 2015, the Board of Directors authorized the Company to repurchase up to 3,000 shares of the Company's common stock with no established end date. The authorization allows for repurchases to be made in the open market or through negotiated transactions from time to time. During the twelve months ended December 31, 2016, we repurchased 615 shares of common stock. At December 31, 2016, there were 711 shares available for future stock repurchases under this repurchase authorization. Shares of common stock purchased under the share repurchase authorization are retired.

The following table summarizes the Company's stock repurchases for December 31, 2016, 2015 and 2014:

	Year Ended December 31,		
	2016	2015	2014
Shares of common stock repurchased	615	1,674	1,353
Cost of stock repurchased	$8,044	$20,668	$12,845
Average price paid per share	$13.07	$12.35	$9.49

Table of Contents

RUDOLPH TECHNOLOGIES, INC.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(In thousands, except per share data)

16. Quarterly Consolidated Financial Data (unaudited):

The following tables present certain unaudited consolidated quarterly financial information for the years ended December 31, 2016 and December 31, 2015. In the opinion of the Company's management, this quarterly information has been prepared on the same basis as the consolidated financial statements and includes all adjustments (consisting only of normal recurring adjustments) necessary to present fairly the information for the periods presented. The results of operations for any quarter are not necessarily indicative of results for the full year or for any future period. Year-over-year quarterly comparisons of the Company's results of operations may not be meaningful, as the sequential quarterly comparisons set forth below tend to reflect the cyclical activity of the semiconductor industry as a whole. Other quarterly fluctuations in expenses are related directly to sales activity and volume and may also reflect the timing of operating expenses incurred throughout the year and the purchase accounting effects of business combinations.

	Quarters Ended				
	March 31, 2016	June 30, 2016	September 30, 2016	December 31, 2016	Total
Revenues	$54,362	$62,701	$ 61,641	$ 54,076	$232,780
Gross profit	29,045	34,193	32,449	27,864	123,551
Income before income taxes	19,561	10,593	12,970	6,744	49,868
Net income	13,939	7,601	9,286	6,126	36,952
Income per share:					
Basic	$0.45	$0.25	$ 0.30	$ 0.20	$1.19
Diluted	$0.44	$0.24	$ 0.30	$ 0.19	$1.16
Weighted average number of shares outstanding:					
Basic	30,957	30,779	30,988	31,085	31,128
Diluted	31,654	31,754	31,459	32,018	31,790

	Quarters Ended				
	March 31, 2015	June 30, 2015	September 30, 2015	December 31, 2015	Total
Revenues	$52,570	$59,466	$ 58,597	$ 51,057	$221,690
Gross profit	28,966	31,884	31,912	26,644	119,406
Income (loss) before income taxes	3,097	8,656	10,880	4,179	26,812
Net income	1,848	6,027	7,198	2,883	17,956
Income per share:					
Basic	$0.06	$0.19	$ 0.23	$ 0.09	$0.57
Diluted	$0.06	$0.19	$ 0.22	$ 0.09	$0.56
Weighted average number of shares outstanding:					
Basic	31,928	31,663	31,526	31,016	31,408
Diluted	32,549	32,339	32,204	32,075	32,166

Table of Contents

RUDOLPH TECHNOLOGIES, INC. AND SUBSIDIARIES
SCHEDULE OF VALUATION AND QUALIFYING ACCOUNTS
(In thousands)

Column A	Column B	Column C		Column D	Column E
Description	Balance at Beginning of Period	Charged to (Recovery of) Costs and Expense	Charged to Other Accounts (net)	Deductions	Balance at End of Period
Year 2016:					
Allowance for doubtful accounts	$ 713	$ 5	$ —	$ 38	$ 680
Inventory valuation	8,896	2,953	—	1,304	10,545
Warranty	1,894	2,405	—	2,511	1,788
Deferred tax valuation allowance	2,205	71	(352)	—	1,924
Year 2015:					
Allowance for doubtful accounts	$ 1,279	$ 124	$ —	$ 690	$ 713
Inventory valuation	7,000	3,676	—	1,780	8,896
Warranty	1,574	2,640	—	2,320	1,894
Deferred tax valuation allowance	2,445	(128)	(112)	—	2,205
Year 2014:					
Allowance for doubtful accounts	$ 1,152	$ 127	$ —	$ —	$ 1,279
Inventory valuation	6,101	3,910	—	3,011	7,000
Warranty	1,551	2,048	—	2,025	1,574
Deferred tax valuation allowance	1,756	838	(149)	—	2,445

Table of Contents

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.

Rudolph Technologies, Inc.

By: /s/ Michael P. Plisinski
Michael P. Plisinski
Chief Executive Officer

Date: February 16, 2017

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 AND ON THE DATES INDICATED.

Signature	Title	Date
/s/ Michael P. Plisinski Michael P. Plisinski	Chief Executive Officer	February 16, 2017
/s/ Steven R. Roth Steven R. Roth	Senior Vice President, Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 16, 2017
/s/ Jeffrey A. Aukerman Jeffrey A. Aukerman	Director	February 16, 2017
/s/ Leo Berlinghieri Leo Berlinghieri	Director	February 16, 2017
/s/ Daniel H. Berry Daniel H. Berry	Director	February 16, 2017
/s/ Thomas G. Greig Thomas G. Greig	Director	February 16, 2017
/s/ David B. Miller David B. Miller	Director	February 16, 2017
/s/ John R. Whitten John R. Whitten	Director	February 16, 2017

Table of Contents

EXHIBIT INDEX

Exhibit No.	Description
3.1	Restated Certificate of Incorporation of Registrant, as amended (Conformed Version) (incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q(SEC File No. 000-27965) filed on August 2, 2013).
3.2	Restated Bylaws of Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on August 1, 2007).
3.3	Amendment to Restated Bylaws of Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on February 2, 2009).
4.1	August Technology Corporation 1997 Stock Incentive Plan (incorporated by reference to the Appendix to August Technology Corporation's Proxy Statement for its 2004 Annual Shareholders Meeting (SEC File No. 000-30637) filed on March 11, 2004).
10.1+	License Agreement, dated June 28, 1995, between the Registrant and Brown University Research Foundation (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1, as amended (SEC File No. 333-86821), filed on September 9, 1999).
10.2*	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form S-1/A, as amended (SEC File No. 333-86821), filed on October 14, 1999).
10.3*	Form of 1999 Stock Plan (incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form S-1, (SEC File No. 333-86821) filed on September 9, 1999).
10.4*	Management Agreement, dated as of July 24, 2000 by and between Rudolph Technologies, Inc. and Steven R. Roth as restated and amended on July 29, 2014 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed on August 6, 2014).
10.5*	Employment Agreement, dated as of November 9, 2015, by and between Rudolph Technologies, Inc. and Michael Plisinski (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on November 9, 2015). *
10.6*	Executive Change of Control Agreement, dated February 7, 2014, by and between Rudolph Technologies, Inc. and Richard Rogoff (incorporated by reference to Exhibit 10.10 to the Registrant's Annual Report on Form 10-K filed on February 20, 2015.
10.7*	Executive Change of Control Agreement, dated August 20, 2009, by and between Rudolph Technologies, Inc. and Robert A. Koch (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed on November 06, 2009.
10.8	Form of option agreement under 1999 Stock Plan (incorporated by reference to Exhibit 10.12 to the Registrant's Quarterly Report on Form 10-Q (SEC File No. 000-27965) filed on November 5, 2004).

_____

+ Confidential treatment has been granted with respect to portions of this exhibit.

* Management contract, compensatory plan or arrangement.

Table of Contents

Exhibit No.	Description
10.9*	Form of Restricted Stock Award pursuant to the Rudolph Technologies, Inc. 1999 Stock Plan (incorporated by reference to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965), filed on June 21, 2005).
10.10*	Rudolph Technologies, Inc. 2009 Stock Plan (incorporated by reference to Appendix A of the Registrant's revised Proxy Statement on Form DEFR14A, filed on May 8, 2009).
10.11*	Rudolph Technologies, Inc. 2009 Employee Stock Purchase Plan, as amended (incorporated by reference to Appendix B of the Registrant's revised Proxy Statement on Form DEFR14A, filed on May 8, 2009).
10.12*	Amended form of Restricted Stock Unit Agreement pursuant to the Rudolph Technologies, Inc. 2009 Stock Plan filed herewith.
10.13	Confirmation of Issuer Warrant Transaction dated July 19, 2011, by and between Rudolph Technologies, Inc. and Credit Suisse International (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on July 25, 2011).
10.14	Amendment dated July 22, 2011 to Confirmation of Issuer Warrant Transaction dated July 19, 2011, by and between Rudolph Technologies, Inc. and Credit Suisse International (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K (SEC File No. 000-27965) filed on July 25, 2011).
21.1	Subsidiaries.
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm.
31.1	Certification of Michael P. Plisinski, Chief Executive Officer, pursuant to Securities Exchange Act Rule 13a-14(a).
31.2	Certification of Steven R. Roth, Chief Financial Officer, pursuant to Securities Exchange Act Rule 13a-14(a).
32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, signed by Michael P. Plisinski, Chief Executive Officer of Rudolph Technologies, Inc.
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, signed by Steven R. Roth, Chief Financial Officer of Rudolph Technologies, Inc.

_____

* Management contract, compensatory plan or arrangement.

Exhibit No.	Description
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document