ExOne Co
Form 10-K
March 26, 2015

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, DC 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, 2014

OR

¨ **TRANSITION REPORT PURSUANT TO SECTION 13 or 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from to

Commission file number 001-35806

The ExOne Company

(Exact Name of Registrant as Specified in its Charter)

Delaware	**46-1684608**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**

127 Industry Boulevard North Huntingdon, PA 15642 (Address of Principal Executive Offices) (Zip Code)

(724) 863-9663 (Registrant s telephone number, including area code)

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

Title of Each Class	**Name of Each Exchange On Which Registered**
Common Stock, par value $0.01 per share	**The NASDAQ Global Select Market**

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

None

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ¨

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

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Securities Exchange Act of 1934). Yes ¨ No x

The aggregate market value of common stock held by non-affiliates for the last business day of the registrant s most recently completed second fiscal quarter was approximately $414.6 million.

As of March 20, 2015, 14,521,137 shares of common stock, par value $0.01 were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant s definitive proxy statement to be filed pursuant to Regulation 14A of the general rules and regulations under the Securities Exchange Act of 1934, as amended, for its 2015 Annual Meeting of Stockholders (Proxy Statement) are incorporated by reference into Part III of this Annual Report on Form 10-K.

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EXPLANATORY NOTE

On January 1, 2013, The Ex One Company, LLC, a Delaware limited liability company, merged with and into a Delaware corporation, which survived and changed its name to The ExOne Company. We refer to this as the Reorganization. As a result of the Reorganization, The Ex One Company, LLC became the Company, a Delaware corporation, the common and preferred interest holders of The Ex One Company, LLC became holders of common stock and preferred stock, respectively, of the Company and the subsidiaries of The Ex One Company, LLC became the subsidiaries of the Company. The preferred stock of the Company was converted into common stock on a 9.5 to 1 basis (1,998,275 shares of common stock) immediately prior to our initial public offering (IPO).

On February 6, 2013, the Company s Registration Statement on Form S-1, as amended (File No. 333-185933) was declared effective for the Company s IPO, pursuant to which the Company registered the offering and sale of 6,095,000 shares of our common stock at a public offering price of $18.00 per share for an aggregate offering price of $109.7 million. The IPO closed on February 12, 2013.

On September 9, 2013, we commenced a secondary public offering of 3,054,400 shares of our common stock at a price to the public of $62.00 per share, of which 1,106,000 shares were sold by us and 1,948,400 were sold by selling stockholders (including consideration of the exercise of the underwriters over-allotment option). The secondary offering closed on September 13, 2013.

All consolidated financial information in this report includes the accounts of ExOne, its wholly-owned subsidiaries, ExOne Americas LLC (United States), ExOne GmbH (Germany), ExOne KK (Japan); effective in August 2013, ExOne Property GmbH (Germany); effective in March 2014, MWT Gesellschaft für Industrielle Mikrowellentechnik mbH (Germany); effective in May 2014, ExOne Italy S.r.l (Italy) and through March 27, 2013 (see further description below), two variable interest entities (VIEs) in which ExOne was identified as the primary beneficiary, Lone Star Metal Fabrication, LLC (Lone Star) and Troy Metal Fabricating, LLC (TMF).

All financial information for periods prior to January 1, 2013 is of The Ex One Company, LLC, our predecessor company, and its subsidiaries, and all financial information for periods prior to March 27, 2013, include TMF and Lone Star, two VIEs in which ExOne was identified as the primary beneficiary.

As used in this Annual Report on Form 10-K, unless the context otherwise requires or indicates, the terms ExOne, our Company, the Company, we, our, ours, and us refer to The ExOne Company and its wholly-owned subsidiaries.

IMPLICATIONS OF BEING AN EMERGING GROWTH COMPANY

As a company with less than $1.0 billion in revenue during our last fiscal year, we qualify as an emerging growth company as defined in the Jumpstart our Business Startups Act of 2012 (the JOBS Act). An emerging growth company may take advantage of specified reduced reporting requirements and is relieved of certain other significant requirements that are otherwise generally applicable to public companies.

As an emerging growth company:

- We are exempt from the requirement to obtain an attestation and report from our independent registered public accounting firm on the assessment of our internal control over financial reporting pursuant to the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act;
- We are permitted to provide less extensive disclosure about our executive compensation arrangements;
- We are not required to give our stockholders non-binding advisory votes on executive compensation or golden parachute arrangements; and

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We have elected to use an extended transition period for complying with new or revised accounting standards. We will continue to operate under these provisions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than $1.0 billion in annual revenues, qualify as a large accelerated filer under the Securities Exchange Act of 1934, as amended (the Exchange Act), which requires us to have more than $700 million in market value of our common stock held by non-affiliates, or issue more than $1.0 billion of non-convertible debt over a three-year period. We may choose to take advantage of some, but not all, of these reduced burdens.

TRADEMARKS, SERVICE MARKS AND TRADE NAMES

We have registrations in the United States for the following trademarks: EXONE, EXTEC, LUXCELIS, M-FLEX, ORION, PROFILEVIEW, and S MAX. We also have applications for registration pending for the following trademarks: EXCAST, EXERIAL, EXMAL, X1 ExOne Digital Part Materialization (plus design), INNOVENT, M-PRINT, S-MAX, S-MAX+, S-PRINT, X1, and X1-LAB. We also have registrations for EXONE in China, Europe (Community Trade Mark), Japan, and South Korea, and an application for registration pending in Canada for that trademark. We have registrations for X1 ExOne Digital Part Materialization (plus design) in China, Europe (Community Trade Mark), and South Korea, and applications for registration pending in Brazil and Canada for that mark. We have a registration for the mark X1 pending in Europe (Community Trade Mark). We have a registration for the mark EX-1 in Europe (Community Trade Mark). We have registrations for a stylized form of X1 in Europe (Community Trade Mark) and South Korea. We have registrations for DIGITAL PART MATERIALIZATION in Japan and South Korea. We have an application for registration in Germany for the trademark S-MAX. We have applications for registration pending in Europe (Community Trade Mark) for the trademarks M-FLEX, EXERIAL, and INNOVENT. We also have a registration in Canada for the trademark LUXCELIS. Additionally, in March 2014 we acquired the trade names for Machin-A-Mation Corporation (MAM) and MWT Gesellschaft für Industrielle Mikrowellentechnik mbH (MWT). This Annual Report on Form 10-K also contains trademarks, service marks and trade names of other companies, which are the property of their respective owners. Solely for convenience, marks and trade names referred to in this Annual Report on Form 10-K may appear without the ® or TM symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the right of the applicable licensor to these marks and trade names. Third-party marks and trade names used herein are for nominative informational purposes only and their use herein in no way constitutes or is intended to be commercial use of such names and marks. The use of such third-party names and marks in no way constitutes or should be construed to be an approval, endorsement or sponsorship of us, or our products or services, by the owners of such third-party names and marks.

CAUTIONARY STATEMENT CONCERNING FORWARD LOOKING STATEMENTS

This Annual Report on Form 10-K may contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act with respect to our future financial or business performance, strategies, or expectations. Forward-looking statements typically are identified by words or phrases such as trend, potential, opportunity, pipeline, believe, comfortable, expect, anticipate, current, intention, e
assume, outlook, continue, remain, maintain, sustain, seek, achieve, as well as similar expressions, or future or conditional verbs su
would, should, could and may.

We caution that forward-looking statements are subject to numerous assumptions, risks and uncertainties, which change over time. Forward-looking statements speak only as of the date they are made and we assume no duty to and do not undertake to update forward-looking statements. Actual results could differ materially from those anticipated in forward-looking statements and future results could differ materially from historical performance.

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In addition to risk factors previously disclosed in our reports and those identified elsewhere in this report, the following factors, among others, could cause results to differ materially from forward-looking statements or historical performance: timing and length of sales of machines; risks related to global operations including effects of foreign currency and risks related to the situation in the Ukraine; our ability to qualify more industrial materials in which we can print; the availability of skilled personnel; the impact of increased operating expenses and expenses relating to proposed acquisitions, investments and alliances; our strategy, including the expansion and growth of our operations; the impact of loss of key management; our plans regarding increased international operations in additional international locations; sufficiency of funds for required capital expenditures, working capital, and debt service; the adequacy of sources of liquidity; expectations regarding demand for our industrial products, operating revenues, operating and maintenance expenses, insurance expenses and deductibles, interest expenses, debt levels, and other matters with regard to outlook; demand for aerospace, automotive, heavy equipment, energy/oil/gas and other industrial products; the scope, nature or impact of acquisitions, alliances and strategic investments and our ability to integrate acquisitions and strategic investments; liabilities under laws and regulations protecting the environment; the impact of governmental laws and regulations; operating hazards, war, terrorism and cancellation or unavailability of insurance coverage; the effect of litigation and contingencies; the impact of disruption of our manufacturing facilities or production service centers (PSCs); the adequacy of our protection of our intellectual property; and material weaknesses in our internal control over financial reporting.

These and other important factors, including those discussed under Risk Factors and Management s Discussion and Analysis of Financial Condition and Results of Operations in this Annual Report on Form 10-K, may cause our actual results of operations to differ materially from any future results of operations expressed or implied by the forward looking statements contained in this Annual Report on Form 10-K. Before making a decision to purchase our common stock, you should carefully consider all of the factors identified in this Annual Report on Form 10-K that could cause actual results to differ from these forward looking statements.

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PART I

Item 1. Business.

The Company

We are a global provider of three dimensional (3D) printing machines and 3D printed and other products, materials and services to industrial customers. Our business primarily consists of manufacturing and selling 3D printing machines and printing products to specification for our customers using our installed base of 3D printing machines. We offer pre-production collaboration and print products for customers through our eight PSCs, which are located in the United States, Germany, Italy and Japan. We build 3D printing machines at our facilities in the United States and Germany. We also supply the associated materials, including consumables and replacement parts, and other services, including training and technical support that is necessary for purchasers of our machines to print products. We believe that our ability to print in a variety of industrial materials, as well as our industry-leading printing capacity (as measured by build box size and print head speed) uniquely position us to serve the needs of industrial customers.

Our 3D printing machines use our binder jetting technology, powdered materials, chemical binding agents and integrated software to print 3D products directly from computer models by repeatedly depositing very thin layers of powdered materials and selectively placing chemical binding agents to form the printed product. One of our key industry advantages is that our machines are able to print products in materials which we believe are desired by industrial customers. Currently, our 3D printing machines are able to manufacture casting molds and cores from specialty silica sand and ceramics, which are the traditional materials for these casting products. Of equal importance, our 3D printing machines are capable of direct product materialization by printing in industrial metals, including stainless steel, bronze, iron, bonded tungsten, IN Alloy 625 and glass. We are in varying stages of qualifying additional industrial materials, such as titanium and tungsten carbide. We have also undertaken an analysis of safety precautions for printing reactive materials, including possible facility and machine modifications. Our current material development plan calls for the implementation of such modifications in the beginning of the third quarter of 2015. Our continued goal is to qualify an additional indirect or directly printed industrial material every six months.

We believe that we are a leader in providing 3D printing machines, 3D printed and other products, materials and services to industrial customers in the aerospace, automotive, heavy equipment, energy/oil/gas and other industries. In an effort to further solidify this position, we have (i) expanded our PSC network to eight global locations, (ii) increased capacity and upgraded technology in our production facilities in Germany, including consolidating our operations from five buildings to one multi-purpose manufacturing, research and development, sales and administrative facility, (iii) expanded our materials development initiatives, (iv) selected and are in the process of deploying an Enterprise Resource Planning (ERP) system to promote operational efficiency and financial controls, (v) paid off pre-existing debt, and (vi) deployed working capital to support growth.

Our revenue growth is driven by increasing customer acceptance of our 3D printing technology. We believe that we can accelerate customer adoption of our technology by delivering turnkey 3D printing services and products, from design through product completion. In developing our next generation 3D printing machine platforms, we successfully focused on achieving the volumetric output rate demanded by our industrial customers. Our refined strategic focus emphasizes all phases of the production cycle, notably enhancements to pre-print, such as Computer Aided Design (CAD), simulation, and design optimization, as well as post-print processing, including metal finishing technologies and precision casting capabilities. We are exploring a combination of acquisitions, strategic investments, and/or alliances, some of which we believe will promote advances in pre-print and post-print processing.

We conduct a significant portion of our business with a limited number of customers. Our top five customers represented approximately 23.1%, 25.5%, and 31.7% of total revenue for 2014, 2013 and 2012, respectively. There were no customers for 2014, 2013 or 2012 that individually represented 10.0% or greater of our total revenue. Sales of 3D printing machines are low volume, but generate significant revenue based on their per-unit pricing. Generally, sales of 3D printers are to different customers in each respective period, with the timing of such sales dependent on the customer s capital budgeting cycle, which may vary from period to period. The nature of the revenue from 3D printing machines does not leave us dependent upon a single or a limited number of customers. Sales of 3D printed and other products, materials and services are high volume, but generally result in a significantly lower aggregate price per order as compared to 3D printing machine sales. The nature of the revenue from 3D printed and other products, materials and services does not leave us dependent upon a single or a limited number of customers.

The Company manages its business globally in a single operating segment in which it develops, manufactures and markets 3D printing machines, 3D printed and other products, materials and services. Geographically, the Company conducts its business through subsidiaries in the United States, Germany, Italy and Japan.

Our History

Our business began as the advanced manufacturing business of the Extrude Hone Corporation, which manufactured its first 3D printing machine in 2003 using licensed technology developed by researchers at the Massachusetts Institute of Technology (MIT). In 2005, our business assets were transferred to The Ex One Company, LLC, a Delaware limited liability company, when Extrude Hone Corp. was purchased by another company. In 2007, we were acquired by S. Kent Rockwell through his wholly-owned company Rockwell Forest Products, Inc. On January 1, 2013, our Reorganization was completed when The Ex One Company, LLC was merged with and into a newly created Delaware corporation, which changed its name to The ExOne Company. On February 12, 2013, we completed our IPO, raising approximately $90.4 million in net proceeds after expenses to us. On September 13, 2013 we completed a secondary public offering, raising an additional $64.9 million in net proceeds after expenses to us.

The Additive Manufacturing Industry and 3D Printing

3D printing is the most common type of an emerging manufacturing technology that is broadly referred to as additive manufacturing (AM). In general, AM is a term used to describe a manufacturing process that produces 3D objects directly from digital or computer models through the repeated deposit of very thin layers of material. 3D printing is the process of joining materials from a digital 3D model, usually layer by layer, to make objects using a print head, nozzle, or other printing technology. The terms AM and 3D printing are increasingly being used interchangeably, as the media and marketplace have popularized the term 3D printing rather than AM, which is the industry term.

AM represents a transformational shift from traditional forms of manufacturing (*e.g.*, machining or tooling), which are sometimes referred to as subtractive manufacturing. We believe that AM and 3D printing are poised to displace traditional manufacturing methodologies in a growing range of industrial applications. Our 3D printing process differs from other forms of 3D printing processes, in that we use a chemical binding agent and focus on industrial products and materials.

ExOne and 3D Printing

We provide 3D printed and other products, materials and services primarily to industrial customers and other end-market users. We believe that we are an early entrant into the AM industrial products market and are one of the few providers of 3D printing solutions to industrial customers in the aerospace, automotive, heavy equipment and energy/oil/gas industries.

Our binder jetting 3D printing technology was developed over 15 years ago by researchers at MIT. Our machines build or print products from CAD by depositing successive thin layers of particles of materials such as silica sand or metal powder in a build box. A moveable print head passes over each layer and deposits a

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chemical binding agent in the selected areas where the finished product will be materialized. Each layer can be unique.

Depending on the industrial material used in printing, printed products may need post-production processing. We generally use silica sand or foundry sand for casting, both of which typically require no additional processing. Products printed in other materials, such as glass or metals, or for use in specific applications, may need varying amounts of heat treating, drying or other post-processing.

Pre-Print. We believe that our customers have the opportunity to take greater advantage of the design freedom that our 3D printing technology provides. While we collaborate with our customers to develop and refine CAD designs that meet our customers specifications and can be read and processed by our 3D printing machines, we believe that additional pre-print capabilities would empower our customers to fully exploit the design freedom of 3D printing. As a result, we are exploring ways to develop, through a combination of acquisitions, strategic investments, and/or alliances, advanced CAD, simulation and design optimization tools. With these enhanced pre-print capabilities, our customers will be able to imagine, design, optimize and produce their ideal products, unconstrained by the limitations imposed by traditional manufacturing technologies.

Industrial Materials. As we experience increased demand for our products globally, it is essential that the material supply chain and distribution channels match and be in close proximity to our current and prospective customers. To ensure that such a supply chain exists or quickly develops, we may vertically integrate the supply of our print media. In addition, for the highest quality printed products, the sand grains and metal particles used in the 3D printing process must be uniform in size and meet very specific tolerances. Vertically integrating would have the additional advantage of ensuring that our PSCs and machine customers have certainty of access to the highest quality print media, meeting the exact specifications of our 3D printing machines.

Our Machines. Our 3D printing machines consist of a build box that includes a machine platform and a computer processor controlling the print heads for applying layers of industrial materials and binding agents. We currently build our 3D printing machines in both Germany and the United States. Our machines are used to produce molds for castings, products for end users and prototypes. In some situations, we can make prototypes in metal rather than resin polymer, or make a part from a mold for the casting of a newly designed part, which we then cast at a qualified foundry. As a result, the prototype can be made from the same material as the final production part, which allows for more accurate testing of the prototype. We provide a broad spectrum of qualified materials for direct product materialization and are continuing to qualify additional materials for use in our printing process.

Our machines are used primarily to manufacture industrial products that are ordered in relatively low volumes, are highly complex and have a high value to the customer. For example, the manufacture of an aircraft

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requires several complex parts, such as transmission housings (also known as gear-casings), which are needed in relatively low volume and have a high performance value in the aircraft. There are also a variety of machine parts made in traditional machining processes that can be made more cheaply using those processes. Over time, we may be able to manufacture some of those parts more cost effectively. Our technology is not appropriate for the mass production of simple parts, such as injection molded parts or parts made in metal stamping machines. Traditional manufacturing technology is more economical in making those parts. While we expect over time to be able to increase the kinds of parts that we can make more economically than using subtractive manufacturing, we do not ever expect to use our technology to make simple, low-cost, mass-produced parts.

The bulk of our machines are used to make complex sand molds, which are used to cast these kinds of parts for several industries; although, in some cases, we make the end part directly. We intend to expand the direct part production segment of our business as we grow. In addition, as our technologies advance and our unit cost of production decreases, we believe that we can increase the type and number of products that our 3D printing machines can manufacture in a cost-effective manner, expanding our addressable market. The latest generation in our machine portfolio allows customers to engage with our binder jetting technology for industrial series production, beyond the rapid prototyping and small batch production for which our other systems are being used.

Post-Print Processing. After a product is printed, the bound and unbound powder in the build box requires curing of the chemical binding agent. In the case of molds and cores, curing generally occurs at room temperature and the printed product is complete after the binder is cured. For certain applications, a drying process (utilizing an industrial microwave or other means) may be necessary. The mold or core is then poured at a foundry, yielding the finished metal product. We have identified and work with high quality foundries, and we are exploring ways to enhance the quality of precision castings in order to drive additional demand for our molds and cores and the machine platforms that print them. In conjunction with precision foundry capabilities, we believe that our casting technology offers a number of advantages over traditional casting methods, including increased yield, weight reduction and improved thermal range.

For other materials, such as stainless steel, bronze, iron and bonded tungsten, the product needs to be sintered, or sintered and infiltrated. With sintering, the product is placed into a furnace in an inert atmosphere to sinter the bonded particles and form a strong bonded porous structure. The porous structure can be further infiltrated with another material to fill the voids. After the sintering and infiltration, the product can be polished and finished with a variety of standard industrial methods and coatings. We believe that our direct materialization capabilities enable customers to develop the ideal design for products, free of the design constraints inherent in traditional manufacturing, in the industrial metal of choice and in a more efficient manner than traditional manufacturing methods.

Customers and Sales

Educating Our Customers.

Educating our customers and raising awareness in our target markets about the many uses and benefits of our 3D printing technology is an important part of our sales process. We believe that customers who experience the efficiency gains, decreased lead-time, increased design flexibility, and decreased cost potential of 3D printing, as compared to subtractive manufacturing, are more likely to purchase our machines and be repeat customers of our products. We educate our customers on the design freedom, speed, and other benefits of 3D printing by providing printing and design services and support through our PSCs. We also seek to expose key potential users to our products through our PSCs, installed machines at customers locations, university programs, and sales and marketing efforts.

Production Service Centers.

We have established a network of eight PSCs in North Huntingdon, Pennsylvania; Troy, Michigan; Houston, Texas; Auburn, Washington; North Las Vegas, Nevada; Gersthofen, Germany, Desenzano del Garda, Italy; and Kanagawa, Japan. Our five PSCs located in the United States were certified to ISO 9001:2008 as

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Industrial Additive Manufacturers. Through our PSCs, we provide sales and marketing and delivery of support and printing services to our customers. At our PSCs, our customers see our printing machines in operation and can evaluate their production capabilities before ordering a machine or a printed product. The PSCs are scalable and have a well-defined footprint that can be easily replicated to serve additional regional markets. As described below, placing our PSCs in strategic locations around the world is an important part of our business strategy.

For all customers, we offer the following support and services through our PSCs:

Pre-production Collaboration. Our pre-print services include data capture using software that enables customers to translate their product vision into a digital design format that can be used as an input to our 3D printing equipment. We help our customers successfully move from the design stage to the production stage, and help customers evaluate the optimal design and industrial materials for their production needs. For example, we worked with a customer to design and manufacture parts that eliminated significant weight from a helicopter, which was possible because of the precision of our AM process. Our machines are also able to deliver a replacement for a product broken by the customer rapidly or often immediately because we will already have the production computer file. Using subtractive manufacturing would take significantly longer.

Consumables. We provide customers with the inputs used in our 3D printing machines, including tools, printing media/industrial materials, and bonding agents.

Training and Technical Support. Our technicians train customers to use our machines through hands-on experience at our PSCs and provide field support to our customers, including design assistance, education on industrial materials, operations and printing training, instruction on cleaning, and maintenance and troubleshooting.

Replacement Parts and Service. For the first year after purchase of one of our machines, we provide complimentary service and support. Thereafter, we offer a variety of service and support plans.

Our Competitive Strengths

We believe that our competitive strengths include:

Volumetric Output Rate. We believe that our 3D printing machines provide us the highest rate of volume output per unit of time among competing AM technologies. Because of our early entrance into the industrial market for AM and our investment in our core 3D printing technology, we have been able to improve the print head speed and build box size of our machines. As a result, we have made strides in improving the output efficiency of our machines, as measured by volume output per unit of time. For example, the machine cost per cubic inch for our mid-size Flex machine is approximately 5% of the comparable machine cost of its predecessor, the R 2, assuming a constant 80% utilization rate over a five-year period. With continued advances in our core 3D printing technologies, we believe that our cost of production will continue to decline, increasing our ability to compete with subtractive manufacturing processes, particularly for complex products, effectively expanding our addressable market.

Printing Platform Size. The size of the build box area and the platform upon which we construct a product is important to industrial customers, who may want to either make a high number of products per job run or make an industrial product that has large dimensions and is heavy in final form. The Exerial, is one of the largest commercially available 3D printing build platforms at 3,168 liters. The Exerial is uniquely equipped with two job boxes, each 1.5 times larger than the single job box in our next largest model, the S-Max, a 1,260-liter platform machine, resulting in a total print volume of approximately 2.5 times that of the S-Max. We believe that our technology and experience give us the potential to develop large build platforms to meet the production demands of current and potential industrial customers. In addition, we have created machine platforms in various size ranges in order to cater to the varying demands of our customers. Our two largest platforms, the Exerial and Max machines, are differentiated from the machines of our competitors in their ability to print in an industrial size and scale. Our Innovent (formerly X1-Lab) size platform provides a small build box for both lab work and qualification.

Industrial Materials. Currently, our 3D printing machines are able to manufacture casting molds and cores from specialty silica sand and ceramics, which are the traditional materials for these casting products. Of equal importance, our 3D printing machines are capable of direct product materialization by printing in industrial metals, including stainless steel, bronze, iron, bonded tungsten, IN Alloy 625 and glass. We are in varying stages of qualifying additional industrial materials, such as titanium and tungsten carbide. We have also undertaken an analysis of safety precautions for printing reactive materials, including possible facility and machine modifications. Our current material development plan calls for the implementation of such modifications in the beginning of the third quarter of 2015. Our continued goal is to qualify an additional indirect or directly printed industrial material every six months.

Chemical Binding. We use liquid chemical binding agents during the printing process. We believe that our unique chemical binding agent technology can more readily achieve efficiency gains over time than other AM technologies, such as laser-fusing technologies. For instance, in order to increase the print speed of laser-based technologies, another expensive industrial laser must be added to the manufacturing process, raising the unit cost of production.

International Presence. Since our inception, we have structured our business to cater to major international markets. We have established one or more PSCs in each of North America, Europe and Asia. Because many of our current or potential customers are global industrial companies, it is important that we have a presence in or near the areas where these companies have manufacturing facilities.

Co-location of High Value Production. Over the last few years, many U.S. industrial manufacturers have outsourced products supply or otherwise created long, relatively inflexible supply chains for their high-complexity, high-value products. We believe that over the next few years, many of these companies will need to build these products in the United States, near their main manufacturing facilities, in order to be competitive nationally and internationally. We believe we are well positioned to help these manufacturers co-locate the production of products so as to optimize our customers supply chains.

Our Business Strategy

The principal elements of our growth strategy include:

Expand the Network of Production Service Centers. Our PSCs provide a central location for customer collaboration and provide customers with a direct contact point to learn about our 3D printing technology, buy products printed by us, and purchase our machines. We plan to focus on the utilization and productivity of our existing PSC network, and to consider the appropriate global expansion to match our perceived demand for production as well as prototyping. During 2014 we expanded our PSC network through our investment in the Lombardy region of Italy. This PSC consists of an approximately 3,300 square foot leased facility and utilizes one each of our S-Max and S-Print 3D printing machines. This location also serves as a machine sales center for the country. In 2015, we plan to expand our direct metal printing capabilities to our existing PSCs located in Europe and Asia. Each of our PSCs are located in a major industrial center near existing and potential customers. We continuously monitor both customer and market trends in assessing the opportunity to further expand our global PSC network.

Qualify New Industrial Materials Printable In Our Systems. Our 3D printing machines are used for both development and commercial printing. We believe certain of our customers are interested in printing materials for their own development or other interests without regard to utilizing our post- processing methods. We have qualified for printing for production by customers or in our PSCs the following direct printed materials: 420 stainless steel infiltrated with bronze; 316 stainless steel infiltrated with bronze; iron infiltrated with bronze; IN Alloy 625; bronze; bonded tungsten and glass. We have also qualified silica sand and ceramic sand for indirect printing. We are in varying stages of qualifying additional industrial materials, such as titanium and tungsten carbide. We have also undertaken an analysis of safety precautions for printing reactive materials, including possible facility and machine modifications. Our current material development plan calls for the implementation of such modifications in the beginning of the third quarter of 2015. Our continued goal is to qualify an additional indirect or directly printed industrial material every six months. These qualified materials are distinguishable from printable materials in that they are commercially available for sale in industrial densities or for finished products printed at our PSCs. Our 3D printing machines are used for both development and commercial printing. We believe certain of our customers are interested in printing materials for their own development or other interests without regard to utilizing our post-processing methods. Additional materials printable in our printing systems include cobalt-chrome, IN Alloy 718, iron-chrome-aluminum, 17-4 stainless steel, 316 stainless steel and tungsten carbide. By expanding both qualified and printable materials, we believe we can expand our market share and better serve our industrial customer base. During 2013, we established our ExOne Materials Application Laboratory (ExMAL), which focuses principally on materials testing. We believe ExMAL will assist us in increasing the rate at which we are able to qualify new materials.

Increase the Efficiency of Our Machines to Expand the Addressable Market. We intend to invest in further developing our machine technology so as to increase the volume output per unit of time that our machines can produce. In 2011, we began selling a new second generation mid-sized platform, the S-Print machine. In 2013, we began selling our new M-Flex machine. In 2014, we began selling our S-Max+ and M-Print machines. In 2015, we announced the Innovent and Exerial and expect to deliver our first machines to customers during the year. In each case, the new machines are designed to increase the volume output per unit of time through advances in print head speed and build box size. The Exerial machine is unique compared to ExOne s predecessor systems in that it contains multiple industrial stations that allow for continuous production and simultaneous processing and is targeted at larger scale production achieving improved production speed and efficiency will expand our potential market for our machines and for products made in our PSCs.

Focus Upon Customer Training and Education to Promote Awareness. In addition to using our regional PSCs to educate our potential customers, in 2014 we launched the ExOne Training and Education Center (ExTEC), Academy to advance technical expertise, training and service support for our customer base. Our ExTEC Academy targets not only binder jetting awareness but training of customers and technicians in operations and service. We currently offer ExTEC Academy instruction on indirect printing and machine operation in Gersthofen, Germany, with plans to expand our ExTEC offerings into locations in Japan and the United States. As part of ExTEC, we have supplied 3D printing equipment to more than 20 universities and research institutions, in hopes of expanding the base of future adopters of our technology. At ExTEC Academy, technicians guide our current and prospective customers in the optimal use of 3D printing and customers gain digital access to our 3D printing knowledge database as it continues to evolve. We make ExTEC Academy accessible to universities, individual customers, employees/trainees, designers, engineers, and others interested in 3D printing. We will continue to educate the marketplace about the advantages of 3D printing.

Achieve Revenue Balance and Diversification. Over the long-term, our goal is to balance revenue between machine sales and PSC production, service contracts and consumables. Machine sales tend to be seasonal, less predictable, and generally more heavily impacted by the macroeconomic cycle, as compared to PSC production, service contracts and consumables. As we sell more machines, the machine sales portion of our business will be supplemented by related sales of service, replacement parts and consumables. To avoid being overly dependent on economic conditions in one part of the world, we intend to develop our customer base so that our revenues are balanced across the Americas, Europe and Asia. As overall revenues increase, maintaining this balance will largely be achieved by targeting specific customers and industries for machine sales and by establishing PSCs in each of our key regions.

Advance Pre-Print Design and Post-Print Processing Capabilities to Accelerate the Growth of Our 3D Printing Technology. Our next generation 3D printing machine platforms have achieved the volumetric output rate and quality necessary to serve industrial markets on a production scale. We believe that there is an opportunity to similarly advance the pre-print and post-print processing phases of product materialization to more fully exploit the transformative power of our 3D printing machines and drive growth. These opportunities relate to both direct and indirect product materialization. For direct metal production, we believe that enhancing pre-print processes, notably design optimization tools and suitable print material availability, can greatly accelerate our capture of market share in the near-term. Additionally, enhancements to post-print processing will increase the applications for printed products. Through ExMAL, we are developing post-print processing technologies to achieve fully dense metal product materialization without the need for infiltration, and we are exploring technology sharing partnerships to further this initiative. In indirect production utilizing 3D printed molds and cores, advanced performance casting technologies can be leveraged to increase yields and reduce weight of casted products. To address the market opportunity and fill the execution gap, we have developed a suite of processes, many of which are proprietary, for producing high-quality castings through a process that we call ExCast. ExCast provides industry guidance and support through all stages of production, from CAD at the design stage, through the 3D materialization of molds and cores, metal casting of the end product and rapid delivery to the end-user.

Pursue Growth Opportunities Through Acquisitions, Alliances and/or Strategic Investments. We intend to opportunistically identify and, through acquisitions, alliances and/or strategic investment, integrate and advance complementary businesses, technologies and capabilities. Our goal is to expand the functionality of our products, provide access to new customers and markets, and increase our production capacity. We are in active discussions with parties that we believe can contribute to a superior end-to-end manufacturing process. Additional information regarding recent acquisitions and strategic investments is described under **Item 1 Business 2014 Acquisitions**.

Our Machines and Machine Platforms

We produce a variety of machines in order to enable designers and engineers to rapidly, efficiently, and cost-effectively design and produce industrial prototypes and production parts. The models of our machines differ based on the materials in which they print, build box size, and production speeds, but all utilize our advanced technology and designs. The variation in the models of machines that we produce allows for flexibility of use based on the needs of our customers.

Exerial. The Exerial is our newest indirect printing machine. It is unique compared to our other indirect printing systems in that it contains multiple industrial stations that allow for continuous production and simultaneous processing. The Exerial is distinctly equipped with two job boxes, each 1.5 times larger than the single job box in our next largest model, the S-Max. Notably, the Exerial system offers a total build platform of 3,168 liters and is expected to be capable of printing output rates nearly four times faster than the S-Max. The Exerial utilizes a new recoater system, multiple print heads and automation controls. As part of the development of the Exerial, we have filed five patents related to machine design elements. We will formally debut this machine at the GIFA International Foundry Trade Fair in Dusseldorf, Germany in June 2015 and expect to begin selling this machine in 2015.

S-Max/S-Max+. The S-Max machine is our largest indirect printing machine presently available. We introduced the S-Max machine in 2010 to provide improved size and speed over the predecessor model, the S-15. The S-Max has a build box size of 1,800 x 1,000 x 700mm. The S-Max machine is generally used by customers interested in printing complex molds and cores on an industrial scale for casting applications. Each of our global PSCs has at least one S-Max machine installed on-site. In addition to our traditional S-Max machine, during 2014 we introduced an S-Max+ configuration designed for easier post-processing of the build box for certain applications which require phenolic or sodium silicate binder for printing.

S-Print/M-Print. The S-Print (indirect) and M-Print (direct) machines are our mid-sized printing machines presently available. Both the S-Print and M-Print have a build box size of 800 x 500 x 400mm.

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The S-Print machine is generally used by customers interested in printing objects made from silica sand and ceramics, with a particular focus on industrial applications for smaller casting cores that are often required for the aerospace industry, especially in hydraulic applications. The build box size also permits the use of exotic and expensive print materials, such as ceramics, that are required for high heat/high strength applications. The M-Print machine is generally used by customers interested in direct printing of objects made from metals and glass. We have installed both S-Print and M-Print machines in certain of our PSCs to complement our S-Max and S-15 machines currently in use.

M-Flex. The M-Flex machine is our most flexible direct printing machine presently available. We introduced the M-Flex machine platform in 2013 to satisfy the demand for a large range of industrial customers that are interested in directly printing metals, ceramic and glass products. We have further developed a collaborative process for assisting the users in production implementation through our ExTEC and ExMAL organizational efforts. The M-Flex has a build box size of 400 x 250 x 250mm.

Innovent. The Innovent is the smallest of our direct printing machines presently available. We introduced the Innovent machine in 2014 to provide improved size and speed over the predecessor model, the X1-Lab. As an industrial-grade, laboratory-sized machine, Innovent allows for testing material properties, specifically in educational institutions, research laboratories, and research and development departments at commercial organizations. Innovent is uniquely designed in that it balances a specific build box for the technical qualification of materials with a smaller overall lab machine platform size, when compared to other industrial-grade 3D printers. Innovent offers a build volume that is eight times larger than the previous X1-Lab model measuring at 65 x 160 x 65mm.

MWT Microwave. We offer industrial grade microwaves to be used in conjunction with our 3D printing systems for thermally processing certain sand molds or cores that are 3D printed using binders, such as phenolic binder, that require a drying process. Our microwave technology improves casting quality and reduces production costs for customers in specific industries, such as magnesium parts for aviation and steel alloy parts for hydraulic components. Our microwaves are customized designs and work with various of our systems, including Exerial, S-Max+ and S-Print.

Orion. The Orion is our laser micromachine. Micromachining is an integrated process that combines the use of a short pulse laser with a patented trepanning (which is a type of laser drilling) head to capture and manipulate a laser beam. By controlling and manipulating the beam, the Orion machine can remove microns of material from precise locations with thousands of pulses per second. The beam manipulation capability allows for shape design features like tapers, making the Orion machine an effective tool for production of automotive and aerospace components. We elected to discontinue this product line effective at the end of 2014 in an effort to focus our attention on our core 3D printing technologies.

Binding

We use liquid chemical binding agents (including phenolic and sodium silicate) during the 3D printing process.

Phenolic binder, used with ceramic sand in the 3D printing of molds and cores, offers customers three benefits: (i) casting higher heat alloys; (ii) creating a higher strength mold or core; and (iii) improving the quality of the casting due to reduced expansion of the mold or core. These capabilities address challenges faced by the automotive, aerospace, heavy equipment and energy/oil/gas industries.

Sodium silicate reduces or eliminates the release of fumes and gas in the casting process, helping to reduce costs associated with air ventilation and electrical and maintenance equipment, which we believe will appeal to casting houses that are in search of cleaner environmental processes.

We believe that our unique chemical binding agent technology can more readily achieve efficiency gains over time than other AM technologies such as laser-fusing technologies. For instance, in order to increase the print speed of laser-based technologies, another expensive industrial laser must be added to the manufacturing process, raising the unit cost of production.

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Marketing and Sales

We market our products under the ExOne brand name in our three major geographic regions the Americas, Europe and Asia. Our sales are made primarily by our global sales force. Our sales force is augmented, in certain territories, by representatives with specific industry or territorial expertise. Even where we are supported by a representative, all of our product and service offerings provided by our PSCs are sold directly to customers by us.

We believe that our direct selling relationship helps to create one of the building blocks for our business the creation of true collaboration between us and industrial customers who are interested in 3D printing. Increasingly, industrial producers are considering shifting from subtractive manufacturing techniques to 3D printing. Our marketing efforts include educating potential customers about 3D printing technology through collaboration starting with pre-production services and continuing with production and technical support at our PSCs. Currently, members of our salesforce are located in North Huntingdon, Pennsylvania; Troy, Michigan; Houston, Texas; Auburn, Washington; North Las Vegas, Nevada; Gersthofen, Germany; Desenzano del Garda, Italy; and Kanagawa, Japan. In addition, in 2013 and 2014 we have opened international sales offices or appointed individual sales representatives in each of China, Brazil, Italy, Russia, United Kingdom, Spain, Portugal, France, Slovenia, Turkey, India, South Korea, Taiwan and Singapore, expanding our sales efforts for the full range of ExOne products and services.

2014 Acquisitions

On March 3, 2014, ExOne Americas purchased (i) substantially all the assets of MAM, a specialty machine shop located in Chesterfield, Michigan, and (ii) the real property on which MAM s business is located for an aggregate purchase price of approximately $4.9 million. The MAM business remains in its current Michigan location, complementing our nearby PSC in Troy, Michigan. This PSC focuses on advanced 3D printed cores and molds for the aerospace and shipbuilding industries. In addition, we expect to continue to serve and expand the existing MAM industrial customer base. We believe that MAM s specialty precision machining expertise helps us address the finishing requirements for complex parts which are cast from our 3D printed sand molds.

On March 6, 2014, ExOne GmbH acquired all of the shares of MWT, a pioneer in industrial grade microwaves with leading design and manufacturing experience based in Elz, Germany, for approximately $4.8 million. We believe that this acquisition enhances our position as the market leader of 3D sand production systems for industry. Industrial grade microwaves are used for thermally processing certain sand molds or cores that are 3D printed using binders, such as phenolic binder, that require a drying process. Importantly, microwave technology improves casting quality and reduces production costs for customers in specific industries, such as magnesium parts for aviation and steel alloy parts for hydraulic components. MWT designs and manufactures equipment that is currently employed in our PSC operations. We also plan to offer this technology to customers in future system sales. The MWT microwave operation will be operationally integrated with our Gersthofen, Germany manufacturing operations in 2015.

Our Customers

Our customers are located primarily in the Americas, Europe and Asia. We are a party to non-disclosure agreements with many of our customers, and therefore, are often prohibited from disclosing many of our customers identities. Our customers include several Fortune 500 companies that are leaders in their respective markets. The primary industries that we currently serve are:

- Aerospace;
- Automotive;
- Heavy equipment; and
- Energy/oil/gas.

We conduct a significant portion of our business with a limited number of customers. Our top five customers represented approximately 23.1%, 25.5%, and 31.7% of total revenue for 2014, 2013 and 2012, respectively. There were no customers for 2014, 2013 or 2012 that individually represented 10.0% or greater of total revenue. Sales of 3D printing machines are low volume, but generate significant revenue based on their per-unit pricing. Generally, sales of 3D printers are to different customers in each respective period, with the timing of such sales dependent on the customer s capital budgeting cycle, which may vary from period to period. The nature of the revenue from 3D printing machines does not leave us dependent upon a single or a limited number of customers. Sales of 3D printed and other products, materials and services are high volume, but generally result in a significantly lower aggregate price per order as compared to 3D printing machine sales. The nature of the revenue from 3D printed and other products, materials and services does not leave us dependent upon a single or a limited number of customers.

For 3D printing machines, our terms of sale vary by transaction. To reduce credit risk in connection with 3D printing machine sales, we may, depending upon the circumstances, require certain amounts be prepaid. In some circumstances, we may require payment in full and may require international customers to furnish letters of credit. For 3D printed and other products and materials, our terms of sale generally require payment within 30 to 60 days after delivery, although we also recognize that longer payment periods are customary in some countries where we transact business. Services arrangements are generally billed in accordance with specific contract terms which typically correspond to performance of the related services.

Services and Warranty

We have fully trained service technicians to perform machine installations in the Americas, Europe and Asia. We generally provide an industry standard one-year warranty on installed machines. Customers can purchase additional service contracts for maintenance and service. We also sell replacement parts which we maintain in stock worldwide to assist in providing service expeditiously to our customers.

Suppliers

Our largest suppliers in 2014, based upon dollar volume of purchases, were Bauer GmbH & Co KG, Erhardt & Leimer GmbH, Bosch Rexroth AG, Fuji Film Dimatix, Sciullo Machine, Intek Systems and T&S Materials.

We buy our industrial materials from several suppliers and, except as set forth below, the loss of any one would not materially adversely affect our business. We currently have a single supplier of print heads for our 3D printing machines. While we believe that our print head supplier is replaceable, in the event of the loss of that supplier, we could experience delays and interruptions that might adversely affect the financial performance of our business. Additionally, we obtain certain pre-production services through design and data capture providers, and certain post-production services though vendors with whom we have existing and good relationships. The loss of any one of these providers or vendors would not materially adversely affect our business.

Research and Development

We spent approximately $8.2 million, $5.1 million, and $1.9 million on research and development during 2014, 2013 and 2012, respectively. We expect to continue to invest significantly in research and development in the future.

A significant portion of our research and development expenditures have been focused upon the:

- Chemistry of print materials and binder formulation;
- Mechanics of droplet flight into beds of powder;
- Metallurgy of thermally processing metals that are printed through AM;

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Mechanics of spreading powders in a job box;

Transfer of digital data through a series of software links, to drive a print head; and

Synchronizing all of the above to print ever-increasing volumes of material per unit time.

Intellectual Property

Patents and MIT Licenses. Our technology is covered by a variety of patents or licenses for use of patents. We are the worldwide licensee of certain patents of MIT for certain AM printing processes (the MIT Patents), with exclusive rights to practice the patents in certain fields including the application of the printing processes to metals (with sublicensing rights), and non-exclusive rights to practice the patents in certain fields including the application of the printing processes to certain non-metals (without sublicensing rights). Additionally, we hold patents solely or as majority owner as a result of our own technological developments and from the acquisition of ExOne GmbH (formerly known as Prometal RCT GmbH). Our patents are issued in the United States and in various foreign jurisdictions, including Germany and Japan. As a result of our commitment to research and development, we also hold process patents and have applied for other patents for equipment, processes, materials and 3D printing applications. The expiration dates of our patents range from 2015 to 2031. The next MIT Patents scheduled to expire are in October 2015 and are directed to certain methods for removing powder from internal passages, certain mold configurations and making tools with internal passages. We believe that the expiration of patents in the near term will not impact our business.

The remaining MIT Patents under which we are licensed have expiration dates ranging from 2017 to 2021 in the United States. We believe that the expiration of these licenses will not impact our business; however, the expiration may allow our competitors that were previously prevented from doing so to utilize binder jetting 3D printing. Nonetheless, we have developed know-how and trade secrets relative to our 3D printing technology and believe that our early entrance into the industrial market provides us with a timing and experience advantage. Through our investment in our technology, we have been able to qualify industrial materials for use in our 3D printing machines, and we intend to continue such efforts. In addition, we have taken steps to protect much of our technology as a trade secret. Given the significant steps that we have taken to establish our experience in AM for industrial applications, as well as our ongoing commitment to research and development, we intend to maintain our preeminent position in the AM industry market.

We entere