ExOne Co
Form 10-K
March 29, 2013
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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, 2012

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, Pittsburgh, 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 Securities 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 ¨ No x

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

Indicate by check mark 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. x

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

Large accelerated filer ¨	Accelerated filer ¨
Non-accelerated filer x (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 is not applicable.

As of March 15, 2013, 13,281,608 shares of common stock, par value $0.01 were outstanding.

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Our principal executive offices are located at 127 Industry Boulevard, North Huntingdon, Pennsylvania 15642 and our telephone number is (724) 863-9663. Our website address is *http://www.exone.com*. The information on our website is not part of this Form 10-K.

Available Information

Our website address is *http://www.exone.com.* Information contained on our website is not incorporated by reference into this Form 10-K unless expressly noted. We file reports with the Securities and Exchange Commission (the SEC), which we make available on our website free of charge at http://www.exone.com/financials.cfm. These reports include quarterly reports on Form 10-Q and current reports on Form 8-K, each of which is provided on our website as soon as reasonably practicable after we electronically file such materials with or furnish them to the SEC. We also make, or will make, available through our website other reports filed with or furnished to the SEC under the Exchange Act, including our Proxy Statements and reports filed by officers and directors under Section 16(a) of that Act. You can also read and copy any materials we file with the SEC at the SEC s Public Reference Room at 100 F Street, N.E., Washington, DC 20549. You can obtain additional information about the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition; the SEC maintains a website (http://www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including us.

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GLOSSARY OF DEFINED TERMS AND ABBREVIATIONS

3D means three dimensional.

AM means additive manufacturing.

Amended MIT License Agreement means the amendment to the Amended and Restated Exclusive Patent License Agreement by and between MIT and ExOne, dated January 22, 2013.

Company means The ExOne Company.

EXMAL means ExOne Materials Application Laboratory.

EXONE AMERICAS means ExOne Americas LLC, a Delaware limited liability company and wholly-owned subsidiary of the Company. The Company is the sole member of ExOne Americas, formally known as ProMetal.

EXTEC means ExOne Training and Education Center.

IPO means initial public offering.

LONE STAR means Lone Star Metal Fabrication, LLC.

MAJORITY MEMBER means affiliates of S. Kent Rockwell, our Chairman and Chief Executive Officer, who is the indirect, sole shareholder of RHI and RFP. Each of RHI and RFP have provided funding to us.

MIT means Massachusetts Institute of Technology.

Plan means the 2013 Equity Incentive Plan, adopted by the Board of Directors on January 24, 2013.

ProMetal means ProMetal RCT, LLC, a Delaware limited liability company and wholly-owned subsidiary of the Company. The Company is the sole member of ProMetal. ProMetal s name was changed to ExOne Americas LLC on March 28, 2013.

PSCs means Production Service Centers.

REORGANIZATION means 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.

RFP mean Rockwell Forest Products, Inc.

RHI means Rockwell Holdings, Inc.

SELLING STOCKHOLDER means RHI.

TMF means Troy Metal Fabricating, LLC.

TRUST means the S. Kent Rockwell 1997 Irrevocable Trust.

VARIABLE INTEREST ENTITIES means Lone Star and TMF.

EXPLANATORY NOTE

Reorganization and IPO. 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. 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 the IPO.

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On February 6, 2013, the Company s registration statement on Form S-1 (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 and the offering has closed. The managing underwriter was FBR Capital Markets & Co. and the co-managers were BB&T Capital Markets and Stephens Inc.

As a result of the IPO, the Company received net proceeds on February 12, 2013 of approximately $92.0 million, after deducting underwriting discounts and commissions.

Except as disclosed in the accompanying Form 10-K, the consolidated financial statements and selected historical consolidated financial data and other financial information included in this Form 10-K are those of The Ex One Company, LLC and its subsidiaries and our Variable Interest Entities, TMF and Lone Star, and do not give effect to the Reorganization. As used in this Form 10-K, unless the context otherwise requires or indicates, the terms ExOne, our company, we, our, ours, and us refer to The ExOne Company and its subsidiaries. Except as disclosed in the accompanying Form 10-K, the consolidated financial statements and selected historical consolidated financial data and other financial information included in this Form 10-K, references to the majority member refer to affiliates of S. Kent Rockwell, our Chairman and Chief Executive Officer, who is the indirect, sole shareholder of RHI and RFP. Each of RHI and RFP have provided funding to us. See **Item 13. Certain Relationships and Related Transactions, and Director Independence** in this Annual Report on Form 10-K.

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, or 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 auditors 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
- we have elected to use an extended transition period for complying with new or revised accounting standards.

We may take advantage of 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, 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

This Form 10-K includes our trademarks, service marks, and trade names, such as EXONE, our logo, and ExOne, which are protected under applicable intellectual property laws and are the property of The ExOne Company and our subsidiaries. This 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 Form 10-K may appear without the ® or TM symbols, but such references are not intended to

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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 informational purposes only and in no way constitute or are intended to be a 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 Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended.

Forward-looking statements are subject to risks, uncertainties and assumptions and are identified by words such as expects, estimates, projects, typically anticipates believes, appears, could, plan, and other similar words. Such statements include, but are not limited to, statements concerning future revenue and earnings, involve known and unknown risks, uncertainties and other factors that could cause the actual results of the Company to differ materially from the results expressed or implied by such statements, which include our ability to qualify more materials in which we can print; the availability of skilled personnel; 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; 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, energy and other industrial products; the impact of disruption of our manufacturing facilities or PSOs; 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; and the adequacy of our protection of our intellectual proper, and other factors disclosed under Item 1A. Risk Factors and Item 7 Management s Discussion and Analysis of Financial Condition and Results of Operations included in this annual Report on Form 10-K. Because they are forward-looking, these statements should be evaluated in light of important risk factors and uncertainties.

Should one or more of these risks or uncertainties materialize, or should any of our underlying assumptions prove incorrect, actual results may vary materially from those currently anticipated. Except as required by law, we disclaim any obligation to update or publicly announce any revisions to any of the forward-looking statements contained in this Annual Report on Form 10-K.

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PART I

Item 1. Business

The Company

We are a global provider of 3D printing machines and printed products to industrial customers. Our business primarily consists of manufacturing and selling 3D printing machines and printing products to specifications for our customers using our in-house 3D printing machines. We offer pre-production collaboration and print products for customers through our PSCs, which are located in the United States, Germany and Japan. We build 3D printing machines at our facilities in the United States and Germany. We also supply the associated products, including consumables and replacement parts, and services, including training and technical support, 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 printhead speed), uniquely position us to serve the needs of industrial customers.

Our 3D printing machines use our 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 finished product. One of our key industry advantages is that our machines are able to print products in materials which 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. We are capable of printing in silica sand, ceramics, stainless steel, bronze, and glass, and we are in varying stages of qualifying additional industrial materials for printing, such as titanium, tungsten carbide, aluminum, and magnesium.

We believe that we are a leader in providing 3D printing machines, 3D printed products and related services to industrial customers in the aerospace, automotive, heavy equipment, energy/oil/gas and other industries.

Our business began as the advanced manufacturing business of Extrude Hone Corp., which manufactured its first 3D printing machine in 2003 using licensed technology developed by researchers at MIT. In 2005, our business assets were transferred into 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 RFP. On January 1, 2013, The Ex One Company, LLC was merged with and into a newly created Delaware corporation, which changed its name to The ExOne Company. The initial public offering of our common stock became effective on February 6, 2013. See the Explanatory Note contained in this Annual Report on Form 10-K for additional information regarding the history of the Company.

On March 27, 2013, our wholly-owned subsidiary, ExOne Americas, acquired certain assets, including property and equipment (principally land, buildings and machinery and equipment) held by our two Variable Interest Entities, TMF and Lone Star, and assumed all outstanding debt of such Variable Interest Entities, including certain related interest rate swap agreements. Lone Star is owned by RFP and TMF is owned by the S. Kent Rockwell Revocable Trust. S. Kent Rockwell, our chairman and Chief Executive Officer, is the trustee and beneficiary of the S. Kent Rockwell Revocable Trust, which is the 100% owner of Rockwell Venture Capital, Inc. which is the 100% owner of RFP. See **Item 13. Certain Relationships and Related Party Transactions, and Director Independence.**

Payment of approximately $1.9 million was made to TMF and approximately $0.2 million was made to Lone Star, including a return of capital to these entities, which are controlled by Mr. Rockwell, of approximately $1.4 million. There was no gain or loss or goodwill generated as a result of this transaction. Simultaneous with the completion of this transaction, we also repaid all of the outstanding debt and settled the related interest rate swap agreements assumed from the Variable Interest Entities, resulting in a payment of approximately $4.7 million.

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The Additive Manufacturing Industry and 3D Printing

3D printing is the most common type of an emerging manufacturing technology 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 printhead, 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, the industry term.

AM represents a transformational shift from traditional forms of manufacturing (e.g., machining or tooling) 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 printing primarily to industrial customers and 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, including in the aerospace, automotive, heavy equipment and power fluid handling industries.

Our 3D printing technology was developed over 15 years ago by researchers at MIT. Our machines build or print products from Computer-aided designs (CAD) by depositing successive very thin layers of particles of materials such as silica sand or metal powder in a build box. A moveable printhead passes over each layer and deposits a 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, which requires no additional processing. Parts printed in other materials, such as glass or metals, need varying amounts of heat treating or other post-processing.

Our Machines. Our 3D printing machines consist of a build box that includes a machine platform and a computer processor controlling the printheads for applying layers of industrial materials and binding agents. We currently build our machines in both Germany and the United States. See **Item 1. Business** Our Machines and Machine Platforms. Our machines are used to produce molds for castings, products for end users and

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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 more accurate testing of the prototype. We provide a broad spectrum of qualified materials for direct part production and are continuing to qualify additional materials for use in our printing process. See **Item 1. Business** Competitive Strengths Industrial Materials.

Our machines are mostly used to manufacture industrial products which are ordered in relatively low volumes, are highly complex, and have a high value to the customer. For example, the manufacture of an aircraft requires several complex parts, such as transmission housings (also known as gear-casings), which are needed in relatively low volume and which have a high performance value in the aircraft. 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 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.

Post Processing. After a part is 3D 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 occurs at room temperature and the printed part is complete after the binder is cured. In the case of other materials, such as stainless steel, bronze, and metallic powders, the part needs to be sintered, or sintered and infiltrated. With sintering, the part is placed into a vacuum 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 an infiltrant to fill the voids. After the sintering and infiltration, the part can be polished and finished with a variety of standard industrial methods and coatings.

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 growing number of 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. See **Item 1. Business** Our Business Strategy.

Production Service Centers.

We have established a network of five PSCs in North Huntingdon, Pennsylvania; Troy, Michigan; Houston, Texas; Augsburg, Germany; and Kanagawa, Japan. 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. See **Item 1. Business** Our Business Strategy.

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

***Pre-production Collaboration*.** We provide pre-production collaboration services to both purchasers of our machines and to customers of products printed on our own machines through our PSCs. Our services include data capture using software that enables customers to translate their product vision into

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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 much 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 hour 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 printhead 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 and five-year useful life. 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. Our 1,260-liter platform for our S Max machine is one of the largest commercially available 3D printing build platforms. We believe that our technology and experience give us the potential to develop even larger build platforms to meet the production demands of current and potential industrial customers. In addition, we have created machine platforms in four size ranges in order to cater to the varying demands of our customers. Our two largest platforms, the Max and Print machines, are differentiated from the machines of our competitors in their ability to print in an industrial size and scale. Our Lab size platform provides a small build box for lab work and experimentation.

Industrial Material. 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. We are capable of printing in silica sand, ceramics, stainless steel, bronze, and glass, and we are in varying stages of qualifying additional industrial materials for printing, such as titanium, tungsten carbide, aluminum, and magnesium. There is significant demand for products made of these materials. Most AM companies, however, cannot print industrial products in these materials and focus instead on polymer applications.

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

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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 out-sourced parts supply or otherwise created long, relatively inflexible supply chains for their high-complexity, high-value parts. We believe that over the next few years, many of these companies will need to build these parts 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 parts so as to optimize 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. By the end of 2015, we plan to expand our PSC network from the current five locations to fifteen locations. Like our current PSCs, we plan to locate the additional PSCs in major industrial centers near existing and potential customers. While we may adjust the final locations based upon market considerations, our initial plan includes opening a new PSC in South America and on the west cost of the United States in the second half of 2013, and opening two additional locations in Asia and Western Europe in the first half of 2014.

Qualify New Industrial Materials Printable In Our Systems. Currently, our 3D printing machines are capable of printing in silica sand, ceramics, stainless steel, bronze, and glass, and we are in varying stages of qualifying additional industrial materials for printing, such as titanium, tungsten carbide, aluminum, and magnesium. By expanding into these other materials, we believe we can expand our market share and better serve our industrial customer base. We established EXMAL, which focuses on materials testing. We believe EXMAL will assist us in increasing the rate at which we are able to qualify new materials. EXMAL is led by our Chief Technology Officer, Rick Lucas, whose background includes experience in materials testing and certification. See **Item 10. Directors, Executive Officers, and Corporate Governance** in this Annual Report on Form 10-K.

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 time that our machines can produce. In 2011, we began selling a new second generation mid-sized platform, the S Print machine. In addition, we are marketing our new M Flex machine and expect to deliver our first unit in 2013. See **Item 1. Business** Our Machines & Machine Platforms in this Annual Report on Form 10-K. In both cases, the new machines are designed to increase the volume output per hour over the machines that they will replace through advances in printhead speed and build box size. 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. We will use our regional PSCs to educate our potential customers. In addition, 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. We established EXTEC in our North Huntingdon headquarters. At EXTEC, technicians will guide our current and prospective customers in the optimal use of 3D printing and customers will

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gain digital access to our 3D printing knowledge database as it continues to evolve. We make EXTEC 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. We will focus on machine sales during up-swings in the economy, and focus on the sales of our other products and services during periods of decline in industrial capital investment. In addition, 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.

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.

We have created machine platforms in four size ranges in order to cater to the job sizes at the machine prices that the market demands. Our two largest platforms, the Max size platform and the Print size platform, are differentiated from those of our competitors in their ability to print on an industrial size and scale.

We further differentiate our model name by a prefix of either M or S before the platform name. The S prefix indicates that the machine is largely used for printing molds and cores for castings. The M prefix indicates that the machine is largely used for the direct printing of objects. The largest platform, the Max size, is generally used for castings, and therefore the current model in this platform is the S Max. The Print size platform is broadly applicable in a variety of industrial uses, and therefore, we have introduced the platform with both M Print and S Print machines. We anticipate offering the new Flex platform in an M Flex machine. The Lab size platform is primarily sold and used as the M Lab machine.

Our machines come in a variety of sizes and are named for the size of print job they are able to produce. In descending order by capacity are our Max, Print, Flex, and Lab machines.

S Max. The S Max machine, the largest of our machines, has a build box size of 1.8 meters x 1 meter x ..7 meters and sells for approximately $1.4 million (based upon average model options and exchange rates). The total time to produce an entire build box on the S Max is approximately 24 hours. We introduced the S Max machine in 2010 to provide improved size and speed over the predecessor model, the S 15. Our PSCs each generally have at least one S Max or S 15 machine installed on-site, which provides our customers with the ability to print casting molds and cores on an industrial scale.

S Print/M Print. Our Print machine platform has been completely redesigned and is our current mid-sized machine platform. The S Print machine provides the same cutting edge technology available in the S Max platform, with an average price point of $800,000 (based upon average model options and exchange

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rates). The S Print machine is 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 permits the use of exotic and expensive print materials, such as ceramics, that are required for high heat/high strength applications. The S Print machine build box is approximately 125 liters. This same basic platform is used in the M Print, which is used by customers interested in direct printing of objects made from metals and glass. The average price point of the M Print is $900,000 (based upon average model options and exchange rates). We expect to start installing S Print machines in each PSC to complement the S Max machines currently in use in the first half of 2013.

M Flex. We are actively marketing our Flex machines and are quoting deliveries for the third quarter of 2013. We expect the M Flex to satisfy the demand for a large range of industrial customers that are interested in directly printing metals, ceramic and glass products. The average price point of $350,000 (based upon average model options and exchange rates) is designed to satisfy demand from industrial production houses. We have developed a collaborative process for assisting the users in production implementation through the EXTEC and EXMAL organizational efforts.

M Lab. The M Lab is the smallest of our build platforms. At an average price point of $100,000 (based upon average model options and exchange rates), it is primarily used as a development platform, as well as a teaching tool in an engineering environment. There are over 20 M Lab machines installed at universities and research institutions in the United States and Europe.

Laser Micromachining

We also manufacture the ExMicro Orion (Orion) machine, which is used for both conventional and exotic materials. 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, which we build in the United States, can remove microns of material from precise locations with thousands of pulses per second.

The beam manipulation capability allows us to shape design features like tapers, making the Orion machine an effective tool for production of automotive and aerospace components. The Orion machine sells for approximately $1.0 million, and we shipped the first of these machines to a production customer in the fourth quarter of 2012.

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 ten full-time equivalent, in-house sales people. 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, our sales people are based in North Huntingdon, Pennsylvania; Troy, Michigan; Houston, Texas; Augsburg, Germany; and Kanagawa, Japan (near Tokyo).

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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 markets that we currently serve are:

- aerospace;
- automotive;
- heavy equipment; and
- energy/oil/gas.

Sales of 3D printing machines are low volume but generate significant revenue. Timing of customer purchases is dependent upon the customer s capital budgeting cycle, which may vary from period to period. Sales of 3D printed parts and consumables tend to be from repeat customers that may utilize the capability of our PSCs for three months or longer. Although revenue from 3D printing machines is greater than 40% of our total revenue, the nature of the revenue described above does not leave us dependent upon a single or a limited number of customers. Rather, the timing of the sales can have a material effect on period to period financial results. We had three customers in 2010 (Intek, I Metal, and BMW) and one customer in 2011 (Ryoyu Systems) that represented ten percent or more of our revenue. For 2012, no customer represented ten percent or more of our revenue.

Services and Warranty

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

The Company s terms of sale generally require payment within 30 to 60 days after shipment of a product, although the Company also recognizes longer payment periods are customary in some countries where it transacts business.

Suppliers

Our largest suppliers in 2012, based upon dollar volume of purchases, were Bauer GmbH & Co KG, Bosch Rexroth AG and Batz, Burgel GmbH & Co KG, Fuji Film Dimatix, T&S Materials, RPMC Lasers and Intek Systems.

We buy our industrial materials from several suppliers and, except as set forth below, the loss of any one of which would not materially adversely affect our business. We currently have a single supplier of printheads for our 3D printing machines. While we believe that our printheads 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 preproduction 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 $1.9 million, $1.5 million and $1.2 million on research and development during 2012, 2011 and 2010, respectively. We expect to continue to invest significantly in research and development in the future.

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

- chemistry of binder formulation;
- mechanics of droplet flight into beds of powder;
- metallurgy of thermally processing metals that are printed through AM;
- mechanics of spreading powders in a job box;
- transfer of digital data through a series of software links, to drive a printhead; 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 Prometal RCT GmbH (subsequently renamed ExOne GmbH). Our patents are issued in the United States and in various foreign jurisdictions, including Japan and Germany. 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 2013 to 2029. We believe that the expiration of patents in the near term will not impact our business.

Certain of the MIT Patents under which we are licensed will expire over the next 24 months. 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. However, 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 entered into an Amended and Restated Exclusive Patent License Agreement with MIT in June 2011. The terms of the agreement require that we remit both license fees and royalties to MIT based upon worldwide revenue of licensed products, processes and consumables. The term of the agreement commenced on January 1, 2011, and remains in force until the expiration or abandonment of all issued patent rights.

Effective January 22, 2013, we entered into the Amended MIT License Agreement with MIT related to the MIT Patents. The Amended MIT License Agreement provides, among other things, that we will pay MIT an annual fee of $100,000 for each of the years 2011 through 2016, in satisfaction of a license maintenance fee for such periods. In addition, in 2013, we made a one-time payment to MIT of $200,000 in satisfaction of all remaining royalty payments for licensed products, processes or consumables sold either before or after such amendment. See Note 13 of the Notes to the Consolidated Financial Statements in this Annual Report on Form 10-K for additional information.

Trademarks. We have registered ExOne as a trademark in the United States. We have filed trademark applications for EX ONE, a stylized X1 and the phrase Digital Part Materialization in the United States, Canada, Europe, Japan, China, Korea and Brazil.

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Trade Secrets. The development of our products, processes and materials has involved a considerable amount of experience, manufacturing and processing know-how and research and development techniques that are not easily duplicated. We protect this knowledge as a trade secret through the confidentiality and nondisclosure agreements which all employees, customers and consultants are required to sign at the time they are employed or engaged by us. Additional information related to the risks associated with our intellectual property rights are described within **Item 1A Risk Factors** of this Annual Report on Form 10-K.

Competition

Other companies are active in the market for 3D printing products and services. These companies use a variety of AM technologies, including:

- direct metal deposition;
- direct metal laser sintering;
- electron beam melting;
- fused deposition modeling;
- laser consolidation;
- laser sintering;
- multi-jet modeling;
- polyjet;
- selective laser melting;
- selective laser sintering; and
- stereolithography.

Some of the companies that have developed and employ one or more AM technologies include: 3D Systems Corporation (including the recently acquired Z Corporation), Stratasys Inc. (including the recently acquired Solidscape, Inc. and Objet Ltd.), EOS Optronics GmbH, EnvisionTEC GmbH, and Solid Model Ltd.

Some of these processes and companies compete with some of the products and services that we provide. Despite the challenging competitive landscape, we believe that we are the only AM printing solutions provider that focuses primarily on industrial applications on a production scale. Our competitive advantages, including the size of our build platforms, the speed of our printing heads, the variety of materials used by industrial manufacturers in which we can print, the industry qualification of many of the materials we print in, our robust market capabilities, and our suite of machine system families offering scale and flexibility, also serve to differentiate us from the other competitors in the AM market.

We also compete with established subtractive manufacturers in the industrial products market. These companies often provide large-scale, highly capitalized facilities that are designed or built to fill specific production purposes, usually mass production. However, we believe that we are well positioned to expand our share of the industrial products market from these manufacturers as AM gains recognition. As our technologies improve and our unit cost of production decreases, we expect to be able to compete with subtractive manufacturing on a wide range of products, thereby expanding our addressable market.

Seasonality

Purchases of our 3D printing machines often follow a seasonal pattern owing to the capital budgeting cycles of our customers. Generally, machine sales are higher in our third and fourth quarters than in our first and second quarters.

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Backlog

At December 31, 2012, our backlog (including confirmed purchase orders, deferred revenue and customer prepayments) was $5.1 million. We expect to fulfill our December 31, 2012 backlog for machines and PSCs during the next twelve months. This is compared to a backlog of $7.7 million at December 31, 2011.

Environmental Matters

Compliance with federal, state and local laws and regulations relating to the discharge of materials into the environment or otherwise relating to the protection of the environment has not had a material impact on capital expenditures, earnings or the competitive position of us and our subsidiaries. We are not the subject of any legal or administrative proceeding relating to the environmental laws of the United States or any country in which we have an office. We have not received any notices of any violations of any such environmental laws.

Employees

As of December 31, 2012, we employed a total of 163 (131 full time) employees at our five locations. None of these employees is a party to a collective bargaining agreement, and we believe our relations with them are good.

Geographic Information

Our revenues by geographic region (based upon the country where the sale originated) for the year ended December 31, 2012 were Americas 27.2%, Europe 48.7% and Asia 24.1% as compared to Americas 30.0%, Europe 37.1% and Asia 32.9% for the same period in 2011. Revenues by geographic region for the year ended December 31, 2010 were Americas 29.3%, Europe 51.4% and Asia 19.3%. See Note 17 of the Notes to the Consolidated Financial Statements in this Annual Report on Form 10-K for additional information.