CVD EQUIPMENT CORP
Form 10-K
April 02, 2018

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2017

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: 1-16525

CVD EQUIPMENT CORPORATION

(Exact name of registrant as specified in its charter)

New York	**11-2621692**
(State or Other Jurisdiction of Incorporation or Organization)	*(I.R.S. Employer Identification No.)*

355 South Technology Drive
Central Islip, New York 11722
(Address including zip code of registrant's Principal Executive Offices)

(631) 981-7081
(Registrant's Telephone Number, Including Area Code)

Securities registered under Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, Par value $0.01	**NASDAQ Capital Market**

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data file required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months/(or for such shorter period that the registrant was required to submit and post such files).

Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the 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 a smaller reporting company or an emerging growth company . See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company” and emerging growth company in Rule 12b-2 of the Exchange Act. Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company Emerging Growth Company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes No

State the aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant’s most recently completed second fiscal quarter: $58,029,593 at June 30, 2017

Indicate the number of shares outstanding of each of the registrant’s classes of common stock, as of the latest practicable date: 6,458,714 shares of Common Stock, $0.01 par value at March 15, 2018.

DOCUMENTS INCORPORATED BY REFERENCE: None.

PART I

INFORMATION CONCERNING FORWARD-LOOKING STATEMENTS

Except for historical information contained herein, this Annual Report on 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. Readers are cautioned not to place undue reliance on forward-looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. These statements involve known and unknown risks and uncertainties that may cause our actual results or outcomes to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. These forward-looking statements are based on various factors and are derived utilizing numerous important assumptions and other important factors that could cause actual results to differ materially from those in the forward-looking statements. Important assumptions and other factors that could cause actual results to differ materially from those in the forward-looking statements, include, but are not limited to: competition in our existing and potential future product lines of business; our ability to obtain financing on acceptable terms if and when needed; uncertainty as to our future profitability, uncertainty as to the future profitability of acquired businesses or product lines, uncertainty as to any future expansion of the Company. Other factors and assumptions not identified above were also involved in the derivation of these forward-looking statements and the failure of such assumptions to be realized as well as other factors may also cause actual results to differ materially from those projected. We assume no obligation to update these forward-looking statements to reflect actual results, changes in assumptions, or changes in other factors affecting such forward-looking statements. Past performance is no guaranty of future results.

Item 1. Description of Business.

The use of the words “CVD,” “we,” “us” or “our” refers to CVD Equipment Corporation, a New York corporation incorporated on October 13, 1982, and its wholly owned subsidiaries, CVD Materials Corporation (including its wholly owned subsidiaries CVD Tantaline ApS, and CVD Mesoscribe Technologies Corporation) collectively “CVD Materials”), FAE Holdings 411519R LLC and 555 N Research Corporation except where the context otherwise requires.

We design, develop and manufacture a broad range of chemical vapor deposition, gas control and other state-of-the-art equipment and process solutions used to develop and manufacture materials and coatings for research and industrial applications. This equipment is used by our customers to research, design, and manufacture these materials or coatings for aerospace engine components, medical implants, semiconductors, solar cells, smart glass, carbon nanotubes, nanowires, LEDs, MEMS and other applications. Through CVD Materials and our Application Laboratory, we

provide material coatings, process development support and process startup assistance with the focus on enabling tomorrow’s technologies™.

Based on more than 35 years of experience, we use our engineering, manufacturing and process development to transform new applications into leading-edge manufacturing solutions. This enables university, research and industrial scientists at the cutting edge of technology to develop next generation aerospace, medical, solar, nano, LEDs, semiconductors and other electronic components. We develop, manufacture and provide equipment for research and production based on our proprietary designs. We have built a significant library of design expertise, know-how and innovative solutions to assist our customers in developing these intricate processes and to accelerate their commercialization. This library of solutions, along with our vertically integrated manufacturing facilities, allows us to provide superior design, process and manufacturing solutions to our customers on a cost effective basis.

Our strategy is to target opportunities in the research and development and production equipment market, with a focus on higher-growth applications such as aerospace, medical, solar, smart glass, carbon nanotubes, nanowires, graphene, MEMS and LEDs. To expand our penetration into these growth markets, we have developed a line of proprietary standard products and custom systems. Historically, we manufactured products for research and development on a custom one-at-a-time basis to meet an individual customer's specific research requirements. Our proprietary systems leverage the technological expertise that we have developed through designing these custom systems onto a standardized basic core. This core is easily adapted through a broad array of available add-on options to meet the diverse product and budgetary requirements of the research community. By manufacturing the basic core of these systems in higher volumes, we are able to reduce both the cost and delivery time for our systems. These systems, which we market and sell under the EasyTube® product line, are sold to researchers at universities, research laboratories, and startup companies in the United States and throughout the world.

Sales of our proprietary standard, custom systems and process solutions have been driven by our installed customer base, which includes several Fortune 500 companies. The strong performance and success of our products has historically driven repeat orders from existing customers as well as business from new customers. However, with our proprietary solutions and expanded focus on "*accelerating the commercialization of tomorrow's technologies*™" we have been developing a new customer base in addition to growing with our existing customers. We have generally gained new customers through word of mouth, limited print advertising and trade show attendance. We are now also gaining new customers by their awareness of our company in the marketplace with results from our Application Laboratory, partnerships with startup companies, increased participation in trade shows and expanded internet advertising.

The core competencies we have developed in equipment and software design, as well as in systems manufacturing and process solutions, are used to engineer our finished products and to accelerate the commercialization path of our customer base. Our proprietary-real-time, software allows for rapid configuration, and provides our customers with powerful tools to understand, optimize and repeatedly control their processes. Our vertically integrated structure allows us to control the manufacturing process, from bringing raw metal and components into our manufacturing facilities to shipping out finished products. These factors significantly reduce cost, improve quality and reduce the time it takes from customer order to shipment of our products. Our Application Laboratory allows selected customers to bring up their process tools in our Application Laboratory and to work together with our scientists and engineers to optimize process performance.

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Business Developments

On October 31, 2017, through our newly formed and wholly-owned subsidiary, CVD Mesoscribe Technologies Corporation (“MesoScribe Technologies”), we acquired substantially all of the operating assets and business of Mesoscribe Technologies, Inc. (“MTI”). Formed in 2002, by a group from Stony Brook University, MTI established itself as a pioneer and leader in the direct deposition of thermal sensors, heaters, and instrumentation for harsh environments.

MTI specialized in materials processing using Direct Write MesoPlasma™ printing technology. This technology is an enabling additive manufacturing process whereby materials are printed onto conformal components in precise patterns. MTI has provided MesoPlasma™ printing services and products to its customers for use in aerospace, power generation, satellite, and defense markets, focusing on developing and manufacturing innovative products for advanced sensing, heating, and communication.

This acquisition provides CVD access to additional materials deposition technology, a presence in new markets, and additional applications. In addition, the proprietary MesoPlasma™ technology complements our Tantaline® business which we acquired in Q4 2016. The two technologies when combined provide a treatment and coating which provides both corrosion resistance and now wear resistance. This is consistent with our strategic plan to leverage our equipment know-how, business infrastructure and proven ability to scale up new technologies, all offering high value-added materials, products, and services and is another step in our combined organic and acquisition growth strategy.

On November 30, 2017, we closed on the purchase of the premises located at 555 North Research Place, Central Islip, NY 11722 (the “Premises”). The purchase price of the building was $13,850,000 exclusive of closing costs.

On November 30, 2017, the Company’s newly formed wholly-owned subsidiary, 555 N Research Corporation (the “Assignee”) and the Islip IDA, entered into a Fee and Leasehold Mortgage and Security Agreement (the ”Loan”) with HSBC Bank USA, N.A. (the “Bank”) in the amount of $10,387,500, which was used to finance a portion of the purchase price to acquire the Premises. The Loan was evidenced by the certain Note, dated November 30, 2017 (the “Note”), by and between Assignee and the Bank, and secured by a certain Fee and Leasehold Mortgage and Security Agreement, dated November 30, 2017 (the “Mortgage”), as well as a collateral Assignment of Leases and Rents (“Assignment of Leases”).

The Loan is payable in sixty (60) consecutive equal monthly installments of $62,777.60 including interest. The Loan shall bear interest for each Interest Period (as defined in the Note), at the fixed rate of 3.9148%. The maturity date for the Note is December 1, 2022.

As a condition of the Bank making the Loan, the Company was required to guaranty Assignee's obligations under the Loan pursuant to that certain Unlimited Guaranty, dated November 30, 2017 (the "Guaranty").

With the completed purchase of the additional facility at the Premises, we now have the manufacturing space to accelerate our capabilities of providing materials, coatings and surface treatments to meet our customers' needs. We have now positioned ourselves for the expansion of our carbon composites and electronic material, Tantaline® and Mesoscribe Technologies product lines.

Segments

CVD/First Nano supplies state-of-the-art chemical vapor deposition systems for use in the research, development and manufacturing of aerospace and medical components, semiconductors, LEDs, carbon nanotubes, nanowires, solar cells and a number of other industrial applications. We utilize our expertise in the design and manufacture of chemical vapor deposition systems to work with laboratory scientists to bring state-of-the-art processes from the research laboratory into production, as well as to provide production equipment and process solutions based on our designs. CVD/First Nano also operates our Application Laboratory where our personnel interact effectively with the scientists and engineers of our customer base. CVD/First Nano operates out of our main facility in Central Islip, New York.

SDC designs and manufactures ultra-high purity gas and chemical delivery control systems for state-of-the-art semiconductor fabrication processes, solar cells, LEDs, carbon nanotubes, nanowires, and a number of industrial applications. Our SDC products are sold on either a stand-alone basis, or together with our CVD/First Nano systems. SDC operates out of a 22,000 square foot facility fitted with Class 10 and Class 100 clean room manufacturing space located in Saugerties, New York.

CVD Materials Tantaline® treatment is a diffusion bonded protective layer of tantalum formed by chemical vapor deposition on the surface of common materials. Tantalum is the most corrosion resistant metal commercially available. This surface layer provides protection against many of the most aggressive environments including high temperature, concentrated acid. Global sales and technical support comes out of our facility in Central Islip, New York with production provided out of our European facility located in Nordborg, Denmark. Future expansion of production capacity in the US has previously been announced. Although revenues have not been significant, we have incurred approximately $1.2 million in costs through December 31, 2017.

MesoScribe Technologies provides MesoPlasma™ printing services and products (heaters, antennas, & sensors) to aerospace, satellite, power generation, defense, and other markets requiring high performance. MesoScribe Technologies operates out of a 22,000 square foot facility located in Huntington Beach, CA with sales and marketing support out of our main facility in Central Islip, New York. Revenues and costs have not been material through December 31, 2017.

Principal Products

Chemical Vapor Deposition - A process which passes a gaseous compound over a target material surface that is heated to such a degree that the compound decomposes and deposits a desired layer onto substrate material. The process is accomplished by combining appropriate gases in a reaction chamber, of the kind produced by the Company, at elevated temperatures (typically 150-1,800° Celsius). Our chemical vapor deposition systems are complete and include all necessary instrumentation, subsystems and components and include state-of-the-art process control software. We provide both standard and specifically engineered products for particular customer applications. Some of the standard systems we offer are for silicon, silicon-germanium, silicon dioxide, silicon nitride, polysilicon, liquid phase epitaxial, metalorganic chemical vapor deposition, carbon nanotubes, graphene nanowires, solar cell research and solar material quality control.

Chemical Vapor Deposition Systems - Used in a variety of models for laboratory research and production. All models are offered with total system automation, a microprocessor control system by which the user can measure, predict and regulate gas flow, temperature, pressure and chemical reaction rates, thus controlling the process in order to enhance the quality of the materials produced. Our standard microprocessor control system is extremely versatile and capable of supporting the complete product line and most custom system requirements. These chemical vapor deposition systems are typically priced between $80,000 and $1,500,000, but can go significantly higher.

Rapid Thermal Processing ("RTP") - Used to heat semiconductor materials to elevated temperatures of up to 1,000° Celsius at rapid rates of up to 200° Celsius per second. Our RTP systems are offered for implant activation, oxidation, silicide formation and many other processes. We offer systems that can operate both at atmospheric or reduced pressures. Our RTP systems are priced up to $600,000.

Annealing, Diffusion and Low Pressure Chemical Vapor Deposition (LPCVD) Furnaces - Used for diffusion, oxidation, implant anneal, solder reflow, solar cell manufacturing and other processes. The systems are normally operated at atmospheric and/or reduced pressure with gaseous atmospheres related to the process. An optional feature of the system allows for the heating element to be moved away from the process chamber allowing the wafers to rapidly cool or be heated in a controlled environment. Our cascade temperature control system enables more precise control of the wafers. The systems are equipped with an automatic process controller, permitting automatic process sequencing and monitoring with safety alarm provisions. Our annealing and diffusion furnace systems are priced up to $900,000.

Ultra-high Purity Gas and Liquid Control Systems - Our standard and custom designed gas and liquid control systems, which encompass gas cylinder storage cabinets, custom gas and chemical delivery systems, gas and liquid valve manifold boxes and gas isolation boxes, provide safe storage and handling of pressurized gases and chemicals. Our system design allows for automatic or manual control from both a local and remote location. A customer order often includes multiple systems and can total up to $1,000,000.

Quartz-ware - We provide standard and custom fabricated quartz-ware used in our equipment and other customer tools. We also provide repair and replacement of existing quartz-ware.

MesoPlasma™ Direct Write Printing: A materials deposition process that provides high definition traces, fine feature patterns, and coatings onto conformal components. Powder materials are injected into a thermal plasma where they are rapidly heated and deposited onto the substrate or component. A 6-axis robotic system ensures pattern placement accuracy and manufacturing consistency. The versatility of the process enables a wide range of materials to be deposited including ceramic dielectrics, nickel based sensor alloys, metallic conductors, precious metals, and protective coatings. Products include temperature sensors, heaters, antennas and patterns per customer specifications. Products range in price from $100s-$1,000s of dollars depending on specific materials, pattern complexity, quantity and other factors.

Tantaline® Corrosion Resistant Coating: Tantaline® treatment is provided as part of either a finished product or as a service applied to customer sourced components. These include valves, fittings, fasteners, vessels, bellows, and a wide range of custom designed items. The Tantaline® treatment drastically improves the corrosion resistance of these base stainless steel parts extending the service life and increasing value in a wide range of applications.

Markets and Marketing

Due to the highly technical nature of our products, we believe it is essential to contact customers directly through our sales personnel and through a network of domestic and international independent sales representatives and distributors specializing in the type of equipment, products and services that we sell. In addition to our traditional customer base, we are now accessing new markets and new customers through Tantaline,® MesoScribe,® and other components of our expanding materials business. Our primary marketing activities include direct sales contacts, participation in trade shows and our internet websites. We are also focusing our efforts on being in the top listings on many search engines in order to increase the number of “hits” to our websites.

Customers

We continue to work on expanding our product offerings. Many of these products are used in research and in production applications. We sell our products primarily to electronic component manufacturers, institutions involved in electronic component research (such as universities, government and industrial laboratories) and to industries such as aerospace and medical that require specialized coatings. We have both a domestic and international customer base with hundreds of installed systems.

Given the complexity of some of the systems we sell, revenue from a single customer in any one year can exceed 10.0% of our total sales. In fiscal years 2017 and 2016 one customer represented 66.1% and 45.3% of our annual revenues respectively. The loss of such a key customer, if not replaced by others with a similar amount of revenue, will have a material adverse effect on our business and financial condition.

For the twelve months ended December 31, 2017, approximately $3.0 million or 9.6% of our revenues were generated by sales to customers outside the U.S., compared to $ approximately $2.4 million or 11.9% for the twelve months ended December 31, 2016.

Warranties

Warranties on our equipment can range up to twenty-four months from shipment and we pass along any warranties from original manufacturers of components used in our products. We provide service and support for our installed base of equipment with in-house field service personnel. Warranty costs, including those incurred in fiscal years 2017 and 2016, have been historically insignificant and expensed as incurred.

Competition

We are subject to intense competition. We are aware of other competitors that offer a substantial number of products and services comparable to ours. Many of our competitors (including customers who may elect to manufacture systems for internal use) have financial, marketing and other resources greater than ours. To date, we believe that each of our two segments has been able to compete favorably in markets that include these competitors, primarily on the basis of know-how, technical performance, quality, delivery price and aftermarket support.

CVD/First Nano competes primarily with in-house design and engineering personnel at research and university laboratories with the capacity to design and build their own equipment internally. Due to budgetary and funding constraints, many of these customers are extremely price sensitive. We believe that our systems are among the most advanced available for the targeted market space.

SDC's gas management and chemical delivery control systems are among the most advanced available. We further believe that SDC is differentiated from our competitors through our intimate understanding of how the systems in which our products are incorporated are actually used in field applications. We have gained this understanding as a result of having designed and built complex process gas systems for CVD/First Nano as well as for a number of the world's leading semiconductor, aerospace, medical, solar manufacturers, research laboratories and universities.

Sources of Supply

Many of the components used in producing our products are purchased from unrelated suppliers. We have OEM status with our suppliers but we are not obligated to purchase a pre-determined quantity. We are not dependent on a principal or major supplier and alternate suppliers are available. Subject to lead times, the components and raw materials we use in manufacturing our products are readily obtainable.

We maintain a fully-equipped machine shop that we use to fabricate most of our metal components in-house, including the most complex designed parts of our equipment. The investment in our machine shop has significantly helped in increasing our efficiencies while significantly reducing labor costs and time in production. Similarly, our quartz fabrication capability is sufficient to meet our quartz-ware needs.

Materials procured from the outside and/or manufactured internally undergo a rigorous quality control process to ensure that the parts meet or exceed our requirements and those of our customers. Upon final assembly, all equipment undergoes a final series of complete testing to ensure maximum product performance.

Backlog

As of December 31, 2017, our order backlog was approximately $15.5 million compared to approximately $27.8 million at December 31, 2016, a decrease of $12.3 million, or 44.2%. We received approximately $29.5 million in orders for the twelve months ended December 31, 2017, compared to $42.6 million in orders for the twelve months ended December 31, 2016, a decrease of $13.1 million or 30.8%. Approximately $19.5 million or 64.4% of our orders received for the twelve months ended December 31, 2017 was from other than our largest customer compared to $9.4 million or 22.0% having been received from other than our largest customer during the year ended December 31, 2016. The December 31, 2017 backlog consists of $6.6 million or 42.3% from one customer as compared with the December 31, 2016 backlog which consisted of $23.3 million or 84% from that same customer. Although the overall backlog has decreased year over year we have diversified our cusomter base away from one customer as we focus on new opportunities with new and existing customers. The timing for completion of the backlog varies depending on the product mix and can be as long as two years. Order backlog is usually a reasonable management tool to indicate expected revenues, however, it does not provide an assurance of future achievement or profits as order cancellations or delays are possible.

Intellectual Property

Our success is dependent, in part on our proprietary technology and other proprietary rights. We have historically protected our proprietary information and intellectual property such as design specifications, blueprints, technical processes and employee know-how through the use of non-disclosure agreements. In addition, where we deem appropriate, we file for patent and trademark protection of our proprietary technology and intellectual property that has the potential to be incorporated into our products and can be sold to multiple customers. We also maintain and/or assert rights in certain trademarks relating to certain of our products and product lines, and claim copyright protection for certain proprietary software and documentation.

While patent, copyright and trademark protections for our intellectual property are important to different degrees for our various products and solutions, we believe our future success in highly dynamic markets is most dependent upon the technical competence and creative skills of our personnel and our ability to accelerate the commercialization of next generation intellectual properties. We attempt to protect our trade secrets and other proprietary information through non-disclosure agreements with our customers, suppliers, employees and consultants and other security measures.

Research and Development

The university research community is at the forefront of nanotechnology research, and we are focused on providing state-of-the-art systems to this market that will help bridge the gap between pioneering research and marketable products. Our Application Laboratory, together with a number of leading universities and startup companies with whom we partner from time to time, conducts cutting-edge research on the growth of carbon nanotubes, graphene and nanowires as well as on selected solar cell manufacturing processes and smart glass coating processes. The results of this research could have far reaching implications concerning the use and manufacture of carbon nanotubes, graphene and nanowires, solar cell and glass coatings for many markets. Our intention is that together with these leading universities and start-up companies, we will leverage our collective expertise in this field, which will allow us to capitalize on commercial opportunities in the future. This relationship has thus far produced leading edge results, including what we believe are the tallest carbon nanotube arrays yet developed.

In 2017, we incurred approximately $1.8 million in research and development expenses of which $437,000 was independent of external customer orders compared to 2016, when we incurred $2.4 million of research and development expenses, $434,000 of which was independent of external customer orders.

Government Regulation

We are subject to a variety of federal, state and local government regulations, such as environmental, labor and export control. We believe that we have obtained all necessary permits to operate our business and that we are in material compliance with all laws and regulations applicable to us.

We are not aware of any government regulations or requirements necessary for the sale of our products, except that certain approvals or permits may be required for the export of certain of our products to particular foreign countries (depending on the type and specification of the equipment ordered).

Insurance

Our products are used in our customers' manufacturing processes which in some cases contain explosive, flammable, corrosive and toxic gases. There are potential exposures to personal injury as well as property damage, particularly if operated without regard to the design limits of the systems and components. Additionally, the end products of some of our customers are used in areas such as aerospace and high tech devices where safety is of great concern. Management reviews its insurance coverage on an annual basis or more frequently if appropriate and we believe we have the types and amounts of insurance coverage that are sufficient for our business.

Employees

At December 31, 2017, we had 231 employees, including 16 interns and three part time personnel. We had 124 people in manufacturing, 53 in engineering (including research and development and efforts related to product improvement) 9 in field service, 16 in sales and marketing and 29 in general management, maintenance and administration.

Item 1A. Risk Factors

In addition to the other information set forth in this Annual Report on Form 10-K, our shareholders should carefully consider the risk factors described below. The risks set forth below may not be the only risk factors relating to the Company. Any of these factors, many of which are beyond our control, could materially adversely affect our business, financial condition, operating results, cash flow and stock price.

If demand declines for chemical vapor deposition, gas control and related equipment, or for carbon nanotube and nanowire deposition systems, our financial position and results of operations could be materially adversely affected.

Our products are utilized to develop and manufacture materials and coatings for industrial and research applications that are used in numerous markets including but not limited to aerospace, medical, solar, nano and advanced electronic components. A significant part of our growth strategy involves continued expansion of the sales of our products for industrial as well as research and development purposes by companies, universities and government-funded research laboratories. The availability of funds for these purposes may be subject to budgetary and political restrictions, as well as cost-cutting measures by manufacturers in the markets in which we operate.

If the availability of funds or the demand for capital equipment in the markets in which we operate declines, the demand for our products would also decline and our financial position and results of operations could be harmed.

We have a highly concentrated customer base so that changes in ordering patterns, delays or order cancellations could have a material adverse effect on our business and results of operations.

In fiscal 2017, approximately 66.0% of our net sales was accounted for by one customer. We expect that contracts or orders from a relatively limited number of customers will continue to account for a substantial portion of our business. The mix and type of customers, and sales to any single customer, may vary significantly from quarter to quarter and from year to year. If any of our significant customers do not place orders, or they substantially reduce, delay or cancel orders, we may not be able to replace the business in a timely manner or at all, which could have a material adverse effect on our results of operations and financial condition. Major customers may also seek, and on occasion receive, pricing, payment, intellectual property-related, or other commercial terms that are less favorable to us and can hurt our competitive position.

The conditions of the markets in which we operate are volatile. The demand for our products and the profitability of our products can change significantly from period to period as a result of numerous factors.

The industries in which we operate are characterized by ongoing changes, including:

- the availability of funds for research and development;
- global and regional economic conditions;
- governmental budgetary and political constraints;

changes in the capacity utilization and production volume for research and industrial applications in the markets in which we operate;
the profitability and capital resources of manufacturers in the markets in which we operate; and
changes in technology.

For these and other reasons, our results of operations for past periods may not necessarily be indicative of future operating results.

Volatile and cyclical demand for our products may make it difficult for us to accurately budget our expense levels, which are based in part on our projections of future revenues.

Demand for our equipment and related consumable products may be volatile as a result of sudden changes in supply and demand, and other factors in the manufacturing process. Our orders tend to be more volatile than our revenue, as any change in demand is reflected immediately in orders booked, which are net of cancellations, while revenue, tends to be recognized over multiple quarters as a result of procurement and production lead times, and the deferral of certain revenue under our revenue recognition policies. The fiscal period in which we are able to recognize revenue is also at times subject to the length of time that our customers require to evaluate the performance of our equipment. This could cause our quarterly operating results to fluctuate.

When cyclical fluctuations result in lower than expected revenue levels, operating results may be materially adversely affected and cost reduction measures may be necessary in for us to remain competitive and financially sound. During a down cycle, we must be able to make timely adjustments to our cost and expense structure to correspond to the prevailing market conditions. In addition, during periods of rapid growth, we must be able to increase manufacturing capacity and the number of our personnel to meet customer demand, which may require additional liquidity. We can provide no assurance, that these objectives can be met in a timely manner in response to changes within the industry cycles in which we operate. If we fail to respond to these cyclical change, our business could be seriously harmed.

We do not have long-term volume production contracts with our customers, and we do not control the timing or volume of orders placed by our customers. Whether and to what extent our customers place orders for any specific products, and the mix and quantities of products included in those orders are factors beyond our control. Insufficient orders would result in under-utilization of our manufacturing facilities and infrastructure, and will negatively affect our financial position and results of operations.

We face significant competition and we are relatively small in size and have fewer resources in comparison with many of our competitors.

We face significant competition throughout the world, which may increase as certain markets in which we operate continue to evolve. Our future performance depends, in part, upon our ability to continue to compete successfully worldwide. Some of our competitors are diversified companies that have substantially greater financial resources and more extensive research, engineering, manufacturing, marketing and customer service and support capabilities than we can provide. We face competition from companies whose strategy is to provide a broad array of products, some of

which compete with the products and services that we offer, as well as companies, universities and research laboratories that have the capacity to design and build their own equipment internally. These competitors may bundle their products and services in a manner that may discourage customers from purchasing our products. In addition, we face competition from smaller emerging processing equipment companies, whose strategy is to provide a portion of the products and services that we offer at often lower prices than ours, using innovative technology to sell products into specialized markets. Loss of competitive position could impair our prices, customer orders, revenue, gross margin and market share, any of which would negatively affect our financial position and results of operations. Our failure to compete successfully with these other companies would seriously harm our business. There is a risk that larger, better financed competitors will develop and market more advanced products than those we currently offer, or that competitors with greater financial resources may decrease prices, thereby putting us under financial pressure.

The health and environmental effects of nanotechnology are unknown, and this uncertainty could adversely affect the expansion of our business.

The health and environmental effects of nanotechnology are unknown. There is no scientific agreement on the health effects of nanomaterials in general and carbon nanotubes, in particular, but some scientists believe that in some cases, nanomaterials may be hazardous to an individual's health or to the environment. The science of nanotechnology is based on arranging atoms in such a way as to modify or build materials not made in nature; therefore, the effects are unknown. Future research into the effects of nanomaterials in general, and carbon nanotubes in particular, on health and environmental issues, may have an adverse effect on products incorporating nanotechnology. Since part of our growth strategy is based on sales of research equipment for the production of carbon nanotubes and the sale of such materials, the determination that these materials are harmful could adversely affect the expansion of our business.

We may experience increasing price pressure.

Our historical business strategy for many of our products has focused on product performance and customer service rather than on price. As a result of budgetary constraints, many of our customers are extremely price sensitive when purchasing of capital equipment. If we are unable to obtain prices that allow us to continue to compete on the basis of product performance and customer service, our profit margins will be reduced.

We may not be able to keep pace with the rapid change in the technology we use in our products.

We believe that our continued success in the markets in which we operate depends, in part, on our ability to continually improve existing technologies and to develop and manufacture new products and product enhancements on a timely and cost-effective basis. We must be able to introduce these products and product enhancements into the market in a timely manner, in response to customer's demands for higher-performance research and assembly equipment, customized to address rapid technological advances in capital equipment designs.

Technological innovations are inherently complex, and require long development cycles and appropriate professional staffing. Our future business success depends on our ability to develop and introduce new products, or new uses for existing products, that successfully address changing customer needs. Our success also depends on our ability to achieve market acceptance of our new products. In order to maintain our success in the marketplace, we may have to substantially increase our expenditures on research and development. If we do not develop and introduce new products, technologies or uses for existing products in a timely manner and continually find ways to reduce the cost of developing and producing them in response to changing market conditions or customer requirements, our business could be seriously harmed.

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Manufacturing interruptions or delays could affect our ability to meet customer demand and lead to higher costs, while the failure to estimate customer demand accurately could result in excess or obsolete inventory.

Our business depends on timely supply of equipment, services and related products that meet the rapidly changing technical and volume requirements of our customers. Some key parts to our products are subject to long lead-times and/or obtainable only from a single supplier or limited group of suppliers. Cyclical industry conditions and the volatility of demand for manufacturing equipment increase capital, technical, operational and other risks for us and for companies throughout our supply chain. Further, these conditions may cause some suppliers to scale back operations, exit businesses, merge with other companies, or file for bankruptcy protection and possibly cease operations. We may also experience significant interruptions of our manufacturing operations, delays in our ability to deliver products or services, increased costs or customer order cancellations as a result of:

- The failure or inability of suppliers to timely deliver sufficient quantities of quality parts on a cost-effective basis;
- Volatility in the availability and cost of materials, including rare earth elements;
- Difficulties or delays in obtaining required import or export approvals;
- Information technology or infrastructure failures; and
- Natural disasters or other events beyond our control (such as earthquakes, floods or storms, regional economic downturns, pandemics, social unrest, political instability, terrorism, or acts of war).

If a supplier fails to meet our requirements concerning quality, cost, socially-responsible business practices, or other performance factors, we may transfer our business to alternative sources, which could entail manufacturing delays, additional costs, or other difficulties. In addition, if we need to rapidly increase our business and manufacturing capacity to meet increases in demand or expedited shipment schedules, this may exacerbate any interruptions in our manufacturing operations and supply chain and the associated effect on our working capital.

If any of our customers cancel or fail to accept a large system order, our financial position and results of operations could be materially and adversely affected.

Our backlog, largely consists of orders for customized systems including our chemical vapor deposition equipment and annealing and diffusion furnaces which are built to client specifications. We also have a significant concentration of revenue in a single customer. In 2017, our largest customer accounted for 66.1% of our revenue. These customized systems can have prices that range from $100,000 to several million dollars, depending on the configuration, specific options included and any special requirements of the customer. Because our orders are subject to cancellation or delay by the customer, our backlog at any particular point in time is not necessarily representative of actual sales for succeeding periods, nor does our backlog provide any assurance of achievement of revenues or that we will realize a profit from completing these orders. Since revenues on long-term contracts are recognized by the percentage-of-completion method, if a contract is canceled, we may have to reverse revenue at such time. Our financial position and results of operations could be materially and adversely affected should any large system order be cancelled prior to shipment, or not be accepted by the customer due to alleged non-conformity with product

specifications or otherwise. Likewise, a significant change in the liquidity or financial position of any of our customers that purchase large systems, could have a material impact on the collectability of our accounts receivable and our future operating results. Our backlog does not provide any assurance that we will realize a profit from those orders, or indicate in which period revenue will be recognized.

Our success is highly dependent on the technical, sales, marketing and managerial contributions of key individuals, including Leonard A. Rosenbaum, Chairman of the Board of Directors, Chief Executive Officer and President, and we may be unable to retain these individuals or recruit others.

We depend on our senior executives, including Leonard A. Rosenbaum, our Chairman of the Board of Directors, Chief Executive Officer and President, and certain key managers as well as, engineering, research and development, sales, marketing and manufacturing personnel, who are critical to our business. We do not have long-term employment agreements with our key employees. We presently have a key person life insurance policies on the life of Leonard A. Rosenbaum, for a total insured amount of $5 million, which may not be sufficient to cover our loss of Mr. Rosenbaum's services. Furthermore, larger competitors may be able to offer more generous compensation packages to our executives and key employees, and therefore we risk losing key personnel to those competitors. If we were to lose the services of any of our key personnel, our engineering, product development, manufacturing and sales efforts could be slowed. We may also incur increased operating expenses, and be required to divert the attention of our senior executives to search for their replacements. The integration of any new personnel could disrupt our ongoing operations.

We may not be able to hire or retain the number of qualified personnel, particularly engineering personnel, required for our business, which would harm the development and sales of our products and limit our ability to grow.

Competition in our industry for senior management, technical, sales, marketing and other key personnel is intense. If we are unable to retain our existing personnel, or attract and train additional qualified personnel, our growth may be limited due to a lack of capacity to develop and market our products.

In particular, we have, from time to time, experienced difficulty in hiring and retaining skilled engineers with appropriate qualifications to support our growth strategy. Our success depends on our ability to identify, hire, train and retain qualified engineering personnel with experience in equipment design. Specifically, we need to continue to attract and retain mechanical, electrical, software and field service engineers to work with our direct sales force to technically qualify and perform on new sales opportunities and orders, and to demonstrate our products.

The substantial lead-time required for ordering parts and materials may lead to inventory problems.

The lead-time for ordering parts and materials for some of our products can be several months. As a result, we must order some components based on forecasted demand. If demand for our products lags significantly behind our forecasts, we may order more components than we require, which would result in cash flow problems as well as excess or obsolete inventory.

Acquisitions can result in an increase in our operating costs, divert management's attention away from other operational matters and expose us to other associated risks.

In December 2016, we purchased certain assets formally owned by Tantaline A/S, which we incorporated into a facility in Denmark which is operated by our subsidiary, Tantaline CVD ApS.

On October 31, 2017, through our newly formed and wholly-owned subsidiary, CVD Mesoscribe Technologies Corporation ("MesoScribe Technologies"), we acquired substantially all of the operating assets and business of Mesoscribe Technologies, Inc. ("MTI").

We continually evaluate potential acquisitions of businesses and technologies, and we consider targeted acquisitions that expand our core competencies to be an important part of our future growth strategy. In the past, we have made acquisitions of other businesses with synergistic products, services and technologies, and plan to continue to do so in the future.

Acquisitions involve numerous risks, which include but are not limited to:

- difficulties and increased costs in connection with the integration of the personnel, operations, technologies, services and products of the acquired companies into our existing facilities and operations;
- diversion of management's attention from other operational matters;
- failure to commercialize the acquired technology;
- the potential loss of key employees of the acquired companies
- lack of synergy, or inability to realize expected synergies, resulting from the acquisitions;
- the risk that the issuance of our common stock, if any, in an acquisition or merger could be dilutive to our shareholders;
- the inability to obtain and protect intellectual property rights in key technologies;

the acquired assets becoming impaired as a result of technological advancements or worse-than-expected performance of the acquired assets.

Our financial position and results of operations may be materially harmed if we are unable to recoup our investment in research and development.

The rapid change in technology in our industry requires that we continue to make substantial investments in research and development and selective acquisitions of technologies and products, in order to enhance the performance and functionality of our product line, to keep pace with competitive products and to satisfy customer demands for improved performance, features and functionality. These efforts include those related to the development of technology for the commercialization of carbon nanotubes. There can be no assurance that revenue from future products or enhancements will be sufficient to recover the development costs associated with such products, enhancements or acquisitions, or that we will be able to secure the financial resources necessary to fund future research and development or acquisitions. Research and development costs are typically incurred before we confirm the technical feasibility and commercial viability of a product, and not all development activities result in commercially viable products. In addition, we cannot ensure that products or enhancements will receive market acceptance, or that we will be able to sell these products at prices that are favorable to us. Our business could be seriously harmed if we are unable to sell our products at favorable prices, or if our products are not accepted by the markets in which we operate.

We have made investments in our proprietary technologies. If third parties violate our proprietary rights, or accuse us of infringing upon their proprietary rights, such events could result in a loss of value of some of our intellectual property or costly litigation.

Our success is dependent in part on our technologies and our other proprietary rights. We believe that while patents can be useful and may be utilized by us in the future, they are not always necessary or feasible to protect our intellectual property. The process of seeking patent protection is lengthy and expensive, and we cannot be certain that applications will actually result in issued patents or that issued patents will be of sufficient scope or strength to provide meaningful protection or commercial advantage to us. In addition to patent protection, we have also historically protected our proprietary information and intellectual property such as design specifications, blueprints, technical processes and employee know-how, by limiting access to this confidential information and trade secrets and through the use of non-disclosure agreements. Other companies and individuals, including our larger competitors, may develop technologies that are similar or superior to our technology, or design around the intellectual property that we own or license. Our failure to adequately protect our intellectual property, could result in the reduction or extinguishment of our rights to such intellectual property. We also assert rights to certain trademarks relating to certain of our products and product lines. We have not filed trademark applications to protect such marks with any governmental agency, including, but not limited to the U.S. Patent and Trademark Office. We claim copyright protection for certain proprietary software and documentation, but we have not filed any copyright applications with the U.S. Copyright Office in connection with those works. As a result, we can give no assurance that our trademarks and copyrights will be upheld or successfully deter infringement by third parties.

While patent, copyright and trademark protection for our intellectual property may be important, we believe our future success in highly dynamic markets is most dependent upon the technical competence and creative skills of our

personnel. We attempt to protect our trade secrets and other proprietary information through confidentiality agreements with our customers, suppliers, employees and consultants, and through other internal security measures. However, these employees, consultants and third parties may breach these agreements, and we may not have adequate remedies for wrongdoing. In addition, the laws of certain territories in which we sell our products may not protect our intellectual property rights to the same extent as do the laws of the United States.

Occasionally, we may receive communications from other parties asserting the existence of patent rights or other intellectual property rights that they believe cover certain of our products, processes, technologies or information. If such cases arise, we will evaluate our position and consider the available alternatives, which may include seeking licenses to use the technology in question on commercially reasonable terms, or defending our position. Nevertheless, we cannot ensure that we will be able to obtain licenses, or, if we are able to obtain licenses, that related terms will be acceptable, or that litigation or other administrative proceedings will not occur. Defending our intellectual property rights through litigation could be very costly. If we are not able to negotiate the necessary licenses on commercially reasonable terms or successfully defend our position, our financial position and results of operations could be materially and adversely affected.

Our reputation and operating performance may be negatively affected if our products are not timely delivered.

We provide complex products that often require substantial lead-time for design, ordering parts and materials, and for assembly and installation. The time required to design, order parts and materials and to manufacture, assemble and install our products, may in turn lead to delays or shortages in the availability of some products. If a product is delayed or is the subject of shortage because of problems with our ability to design, manufacture or assemble the product on a timely basis, or if a product or software otherwise fails to meet performance criteria, we may lose revenue opportunities entirely, or experience delays in revenue recognition associated with a product or service. In addition, we may incur higher operating expenses during the period required to correct the problem.

Our lengthy and variable sales cycle may make it difficult to predict our financial results.

The marketing, sale and manufacture of our products, often requires a lengthy sales cycle ranging from several months to over one year before we can complete production and delivery. The lengthy sales cycle makes forecasting the volume and timing of sales difficult, and raises additional risks that customers may cancel or decide not to enter into contracts. The length of the sales cycle depends on the size and complexity of the project, the customer’s in-depth evaluation of our products, and, in some cases, the protracted nature of a bidding process. Because a significant portion of our operating expenses are fixed, we may incur substantial expense before we earn associated revenue. If customer cancellations occur, they could result in the loss of anticipated sales without allowing us sufficient time to reduce our operating expenses.

We need to manage our growth effectively or we may experience difficulty in filling customer orders, declining product quality, increased costs or other operating challenges.

We anticipate that continued growth of our operations will be required to satisfy our projected increase in demand for our products and to avail ourselves of new market opportunities. The expanding scope of our business and the growth

in the number of our employees, customers and products have placed and will continue to place a significant strain on our management, information technology systems, manufacturing facilities and other resources. To properly manage our growth, we may need to hire additional employees, upgrade our existing financial and reporting systems and improve our business processes and controls. We may also be required to expand our manufacturing facilities or add new manufacturing facilities. Failure to effectively manage our growth could make it difficult to manufacture our products and fill orders, as well as lead to decline