
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Aspen Aerogels, Inc.
(Exact name of registrant as specified in its charter)

Delaware
(State or other
jurisdiction of incorporation or organization)

04-3559972
(I.R.S. Employer
Identification Number)

30 Forbes Road, Building B
Northborough, Massachusetts 01532
(508) 691-1111
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Donald R. Young
President and Chief Executive Officer
Aspen Aerogels, Inc.
30 Forbes Road, Building B
Northborough, Massachusetts 01532
(508) 691-1111
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to the public: From time to time after the effective date of this Registration Statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/> (Do not check if a smaller reporting company)	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input checked="" type="checkbox"/>

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 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price Per Share (2)	Proposed Maximum Aggregate Offering Price (2)	Amount of Registration Fee
Common Stock, par value \$0.00001 per share	6,620,452 shares	\$4.455	\$29,494,114	\$3,672.02

(1) Pursuant to Rule 416 of the Securities Act of 1933, as amended, this Registration Statement shall also cover any additional shares of the Registrant's common stock that become issuable by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without receipt of consideration that increases the number of the Registrant's outstanding shares of common stock.

(2) Estimated in accordance with Rule 457(c) solely for purposes of calculating the registration fee on the basis of the average of the high and low prices of Registrant's common stock as reported on The New York Stock Exchange as of a date (November 1, 2017) within five business days prior to the date of filing this Registration Statement.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

The information in this preliminary prospectus is not complete and may be changed. The selling stockholders named in this prospectus may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and the selling stockholders named in this prospectus are not soliciting an offer to buy these securities in any state or other jurisdiction where the offer or sale is not permitted.

Subject to completion, dated November 7, 2017

PROSPECTUS

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6,620,452 Shares of Common Stock

This prospectus relates to the offering and resale by the selling stockholders identified herein of up to 6,620,452 shares of our common stock, par value \$0.00001 per share. These shares were issued to the selling stockholders by Aspen Aerogels, Inc. (“Aspen,” “we,” “us” or the “Company”) principally upon conversion of their shares of convertible preferred stock and convertible promissory notes into common stock in connection with our initial public offering of common stock in June 2014 (the “IPO”) or were purchased by certain of those selling stockholders in the IPO. In addition, certain of these shares were issued to members of our board of directors at the time of the IPO as compensation for their service as directors. We are registering the resale of the shares issued upon conversion of convertible preferred stock and convertible promissory notes as required by the Sixth Amended and Restated Registration Rights Agreement that we entered into with the investors named therein, dated as of June 11, 2012, as amended (the “Registration Rights Agreement”). We will not receive any proceeds from the sale of these shares by the selling stockholders. The selling stockholders may sell the shares as set forth herein under “Plan of Distribution.” For a list of the selling stockholders, see the section entitled “Selling Stockholders” on page 11. To the extent required by the Registration Rights Agreement, we have borne and will continue to bear the costs relating to the registration of these shares.

Our common stock is listed on The New York Stock Exchange (the “NYSE”) under the symbol “ASPN.” On November 1, 2017, the last reported sale price of our common stock on the NYSE was \$4.46 per share. The selling stockholders may sell all or a portion of their shares through public or private transactions at prevailing market prices or at privately negotiated prices.

We may amend or supplement this prospectus from time to time by filing amendments or supplements as required. You should read the entire prospectus and any amendments or supplements carefully before you make your investment decision.

We are an “emerging growth company” as defined under the federal securities laws, and, as such, are eligible for reduced public company reporting requirements. See “Prospectus Summary—Implications of Being an Emerging Growth Company.”

Investment in our common stock involves risks. See “Risk Factors” beginning on page 7 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is _____, 2017

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ABOUT THIS PROSPECTUS

You should rely only on the information contained in this prospectus, incorporated by reference in this prospectus, or contained in any prospectus supplement or free writing prospectus filed with the Securities and Exchange Commission. Neither we nor the selling stockholders have authorized anyone to provide you with additional information or information different from that contained in this prospectus or incorporated by reference in this prospectus. The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of shares of our common stock, and the information we have incorporated by reference in this prospectus is accurate only as of the date of the document incorporated by reference. Our business, financial condition, results of operations and prospects may have changed since such dates. You should read both this prospectus and any prospectus supplement together with additional information under the headings “Where You Can Find More Information” and “Information Incorporated by Reference.” To the extent there are inconsistencies between any prospectus supplement, this prospectus and any documents incorporated by reference, the document with the most recent date will control.

For investors outside the United States: Neither we nor the selling stockholders have done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside the United States.

PROSPECTUS SUMMARY

The following summary highlights selected information contained elsewhere in this prospectus or incorporated by reference in this prospectus. This summary is not complete and does not contain all the information that should be considered before investing in our common stock. Before making an investment decision, investors should carefully read the entire prospectus, and the information incorporated by reference in this prospectus paying particular attention to the risks referred to under the headings “Risk Factors” and “Cautionary Statement Regarding Forward-Looking Statements” and our financial statements and the notes to those financial statements that are incorporated by reference in this prospectus.

As used in this prospectus, unless the context requires otherwise, the terms “Company,” “we,” “our” and “us” refer to Aspen Aerogels, Inc. and our subsidiaries.

Overview

We design, develop and manufacture innovative, high-performance aerogel insulation used primarily in the energy infrastructure and building materials markets. We believe our aerogel blankets deliver the best thermal performance of any widely used insulation product available on the market today and provide a combination of performance attributes unmatched by traditional insulation materials. Our end-use customers select our products where thermal performance is critical and to save money, reduce energy use, preserve operating assets and protect workers.

Our insulation is used by oil producers and the owners and operators of refineries, petrochemical plants, liquefied natural gas facilities, power generating assets and other energy infrastructure. Our Pyrogel and Cryogel product lines have undergone rigorous technical validation by industry leading end-users and achieved significant market adoption. We also derive product revenue from the building materials and other end markets. Customers in these markets use our products for applications as diverse as wall systems, military and commercial aircraft, trains, buses, appliances, apparel, footwear and outdoor gear.

We generate product revenue through the sale of our line of aerogel blankets. We market and sell our products primarily through a sales force based in North America, Europe and Asia. The efforts of our sales force are supported by a small number of sales consultants with extensive knowledge of a particular market or region. Our sales force is responsible for establishing and maintaining customer and partner relationships, delivering highly technical information and ensuring high-quality customer service.

Our salespeople work directly with end-use customers and engineering firms to promote the qualification, specification and acceptance of our products. We also rely on an existing and well-established channel of qualified insulation distributors and contractors in more than 30 countries around the world to ensure rapid delivery of our products and strong end-user support. Our salespeople also work to educate insulation contractors about the technical and operating cost advantages of our aerogel blankets.

We also perform research services under contracts with various agencies of the U.S. government, including the Department of Defense and the Department of Energy, and other institutions. Research performed under contract with government agencies and other institutions enables us to develop and leverage technologies into broader commercial applications.

We manufacture our products using our proprietary technology at our facility in East Providence, Rhode Island. We completed the construction and start-up of a third production line in the East Providence facility during 2015, which increased our annual nameplate capacity to approximately 50 million square feet of aerogel blankets. During the first quarter of 2016, we announced the planned construction of a second manufacturing facility in Statesboro, Georgia supported by a package of incentives from the State of Georgia and local governmental authorities. We have elected to delay construction of this facility to better align the capacity expansion with our assessment of future demand.

During 2016, we entered into a strategic partnership with BASF SE to develop and commercialize products for the building materials and other markets. The strategic partnership included a supply agreement governing the sale of our Spaceloft A2 product to BASF and a joint development agreement targeting innovative products and technologies. Subject to certain preconditions, BASF also agreed to make a series of prepayments to us in the aggregate of \$22 million during the construction of our planned manufacturing facility in Statesboro, Georgia. The prepayments will be either credited against amounts invoiced to BASF for Spaceloft A2 or repaid by us to BASF after December 31, 2023. As a result of our decision to delay construction of the Statesboro facility, we have yet to fulfill the preconditions, and commencement of the prepayments from BASF will be delayed until the preconditions are satisfied.

In July 2017, we announced the launch of a new product, Pyrogel® HPS, a high-temperature aerogel blanket engineered to provide thermal conductivity and economic performance at service temperatures of up to 650°C (1200°F).

During 2016, we filed a complaint for patent for patent infringement principally against two China-based companies at the United States International Trade Commission (“ITC”) and the District Court in Mannheim, Germany. On September 29, 2017, the Administrative Law Judge (“ALJ”) presiding over the ITC investigation issued an Initial Determination finding that the two defendants have infringed our patents relating to aerogel insulation. The ALJ also recommended a limited exclusion order with certification provision as a remedy to prevent the importation of infringing aerogel products into the United States. Respondents have petitioned the ITC for a review of the ALJ’s Initial Determination and a final determination on the violation and remedy is expected from the full ITC commission by January 29, 2018, which final determination will determine whether or not a limited exclusion order will be issued. In the event that a limited exclusion order is issued, the order is subject to a 60-day presidential review period. Upon request by a party, the final determination may be appealed to the United States Court of Appeals for the Federal Circuit. The German litigation remains ongoing.

Our revenue for the nine months ended September 30, 2017 was \$75.3 million, which represented a decrease of \$14.8 million from the nine months ended September 30, 2016. Net loss for the nine months ended September 30, 2017 was \$17.6 million and net loss per diluted share was \$0.76. Net loss for the nine months ended September 30, 2016 was \$6.3 million and net loss per diluted share was \$0.27.

Risks Relating to Our Business

We are an aerogel technology company, and our business and ability to execute our business strategy are subject to a number of significant risks of which you should be aware before you decide to buy shares of our common stock. Among these important risks are the following:

- We have incurred annual net losses since our inception, and we may continue to incur net losses in the future and may never reach profitability.
- We have yet to achieve positive total cash flow, and our ability to generate positive cash flow is uncertain.
- We are dependent on a single manufacturing facility. Any significant disruption to this facility or the failure of any of our three production lines in this facility to operate according to our expectation could have a material adverse effect on our business and results of operations.
- We will require significant additional capital to pursue our growth strategy, but we may not be able to obtain additional financing on acceptable terms or at all.
- A sustained downturn in the energy industry, due to lower oil and gas prices or reduced energy demand, could decrease demand for some of our products and services, which could have a material adverse effect on our business, financial condition and results of operations.
- Shortages of the raw materials used in the production of our products, increases in the cost of such materials or disruptions in our supply chain could adversely impact our financial condition and results of operations.

- The market for insulation products incorporating aerogel blankets is relatively undeveloped and our products may never be widely adopted, which would have a material adverse effect on our business .
- Our products are expensive relative to other insulation products, which could make it more difficult for us to grow our revenue and achieve broader adoption of our aerogel products.
- The insulation market we serve is highly competitive; if we are unable to compete successfully, we may not be able to increase or maintain our market share and revenues.
- From time to time we have had difficulty consistently producing product that meets applicable product specifications and technical and delivery requirements, and such difficulties could expose us to financial, contractual or other liabilities.
- If the expected growth in the demand for our products does not follow each of our planned capacity expansions, then our business will be materially adversely affected.
- If we fail to achieve the increase in production capacity that our continued growth requires in a timely manner, or at all, our growth may be hindered and our business or results of operations may be materially adversely affected.
- A substantial portion of our revenue comes from sales in foreign countries and we may expand our operations outside of the United States, which subjects us to increased economic, trade, foreign exchange, operational and political risks that could adversely impact our business, financial conditions and results of operations and also increase our costs and make it difficult for us to operate profitably.
- We rely on sales to a limited number of direct customers, including distributors, contractors, OEMs, partners and end-use customers for the substantial majority of our revenue, and the loss of one or more significant direct customers or several of our smaller direct customers could materially harm our business. In addition, we understand from our direct customers that a substantial majority of their sales of our products are to a small number of end-use customers and the loss of one or more significant end-use customers or several of our smaller end-use customers could materially harm our business.
- Negative perceptions regarding the safety, quality or other attributes of our products or a failure or a perceived failure of our products could have a material adverse effect on our results of operations and could make us unable to continue our business.
- Failure by us to develop, maintain and strengthen strategic relationships with industry leaders to commercialize our products, particularly in the building materials market, may adversely affect our results of operations and our ability to grow our business.
- Our revenue may fluctuate, which may result in a high degree of variability in our results of operations and make it difficult for us to plan based on our future outlook and to forecast our future performance.
- Our results of operations could be adversely affected if our operating expenses incurred do not correspond with the timing of our revenues.
- We are exposed to the credit risk of some of our direct customers, including distributors, contractors and OEMs, which subjects us to the risk of non-payment for our products.
- Our working capital requirements involve estimates based on demand and production expectations and may decrease or increase beyond those currently anticipated, which could harm our results of operations and financial condition.
- If we lose key personnel upon whom we are dependent, or if we are unable to successfully recruit and retain skilled employees, we may not be able to manage our operations and meet our strategic objectives.
- Our inability to protect our intellectual property rights could negatively affect our business and results of operations.

- We have initiated intellectual property litigation that is costly, and could limit or invalidate our intellectual property rights, divert time and efforts away from business operations, require us to pay damages and/or costs and expenses and/or otherwise have an adverse material impact on our business, and we could become subject to additional such intellectual property litigation in the future.
- We expect that the price of our common stock will fluctuate substantially, which could subject us to securities class action litigation and result in substantial losses to our stockholders.

For additional information about the risks we face, please see the section of this prospectus entitled “Risk Factors.”

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, or JOBS Act, enacted in April 2012. An emerging growth company may take advantage of reduced reporting requirements that are otherwise applicable to public companies. These provisions include, but are not limited to:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or Sarbanes-Oxley Act;
- reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may take advantage of these provisions for up to five years after the first sale of our common equity securities pursuant to an effective registration statement under the Securities Act of 1933, as amended, or the Securities Act. Our first registration statement filed under the Securities Act became effective on June 12, 2014. However, if certain events occur prior to the end of such five year period, including if we become a “large accelerated filer,” our annual gross revenues exceed \$1.07 billion or we issue more than \$1 billion of non-convertible debt in any three year period, we would cease to be an emerging growth company prior to the end of such five year period.

We may choose to take advantage of some but not all of these reduced burdens. We have taken advantage of certain of the reduced disclosure obligations, which include providing reduced executive compensation disclosure in our periodic reports, proxy statements and registration statements, and may elect to take advantage of other reduced burdens in future filings. As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. However, we have irrevocably elected not to avail ourselves of this extended transition period for complying with new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Our Corporate Information

We are a corporation organized under the laws of Delaware. In June 2008, we completed a reorganization pursuant to which our predecessor company merged with and into a newly formed Delaware corporation, renamed Aspen Aerogels, Inc. We own three wholly owned subsidiaries: Aspen Aerogels Rhode Island, LLC, Aspen Aerogels Germany, GmbH and Aspen Aerogels Georgia, LLC. We maintain our corporate offices in Northborough, Massachusetts.

Our corporate headquarters are located at 30 Forbes Road, Building B, Northborough, Massachusetts 01532, and our telephone number is (508) 691-1111. We maintain a website at <http://www.aerogel.com>, to which we regularly post copies of our press releases as well as additional information about us. Our filings with the Securities and Exchange Commission, or SEC, will be available free of charge through the website as soon as

reasonably practicable after being electronically filed with or furnished to the SEC. Information contained in our website does not constitute a part of this prospectus or our other filings with the SEC.

All brand names or trademarks appearing in this prospectus are the property of their respective holders. Use or display by us of other parties' trademarks, trade dress, or products in this prospectus is not intended to, and does not, imply a relationship with, or endorsements or sponsorship of, us by the trademark or trade dress owners.

THE OFFERING

Common stock offered by selling stockholders	6,620,452 shares
Common stock outstanding	23,637,115 shares
Use of proceeds	We will not receive any proceeds from the sale of the shares of common stock offered by the selling stockholders.
Offering price	The selling stockholders may sell all or a portion of their shares through public or private transactions at prevailing market prices or at privately negotiated prices.
Risk factors	You should read the "Risk Factors" section of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
New York Stock Exchange symbol	ASPN

The number of shares of common stock outstanding is based on an aggregate of 23,637,115 shares outstanding as of November 1, 2017, and excludes:

- 2,444,055 shares of common stock issuable upon exercise of outstanding options as of November 1, 2017, at a weighted average exercise price of \$7.63 per share, of which 1,152,433 shares were vested as of such date;
- 834,859 shares of common stock issuable upon vesting of restricted stock units outstanding as of November 1, 2017;
- 120 shares of common stock issuable upon the exercise of warrants to purchase our common stock outstanding as of November 1, 2017, at a weighted-average exercise price of \$8.25 per share; and
- 2,391,406 shares of our common stock that are available for future issuance under our 2014 equity incentive plan.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties and all other information, documents or reports included or incorporated by reference in this prospectus and, if applicable, any prospectus supplement or other offering materials, including the risks and uncertainties discussed under “Risk Factors” in our most recent Annual Report on Form 10-K filed with the SEC, which are incorporated by reference, in this prospectus, and any updates to those risk factors included from time to time in our periodic and current reports filed with the SEC and incorporated by reference in this prospectus. Our business, financial condition or results of operations could be harmed by any of these risks. As a result, you could lose some or all of your investment in our common stock. Additional risks not currently known to us or other factors not perceived by us to present significant risks to our business at this time also may impair our business operations.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENT

This prospectus and the documents incorporated by reference in this prospectus include forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that relate to future events or our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to differ materially from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. Words such as, but not limited to, “believe,” “expect,” “anticipate,” “estimate,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “targets,” “likely,” “will,” “would,” “could,” “should,” “continue,” and similar expressions or phrases, or the negative of those expressions or phrases, are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Although we believe that we have a reasonable basis for each forward-looking statement contained in this prospectus and incorporated by reference in this prospectus, we caution you that these statements are based on our projections of the future that are subject to known and unknown risks and uncertainties and other factors that may cause our actual results, level of activity, performance or achievements expressed or implied by these forward-looking statements, to differ. The sections in our periodic reports, including our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, entitled “Business,” “Risk Factors,” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” as well as other sections in this prospectus and the documents or reports incorporated by reference in this prospectus, discuss some of the factors that could contribute to these differences. These forward-looking statements include, among other things, statements about:

- our beliefs in the appropriateness of our assumptions, the accuracy of our estimates regarding expenses, loss contingencies, future revenues, future profits, uses of cash, available credit, capital requirements, and the need for additional financing;
- our expectations about revenue, expenses, Adjusted EBITDA, GAAP EPS, cash balances and related variations or trends; beliefs about the general strength or health of Aspen Aerogels’ business; the performance of our aerogel blankets; our plans to construct a second manufacturing facility in Statesboro, Georgia; our estimates of annual production capacity;
- beliefs about our strategic partnership with BASF and the potential benefits of such a relationship, including the potential for it to create new product and market opportunities;
- our supply agreement with BASF, our exclusive supply to BASF of its Spaceloft® A2 product, the potential for future cash advances from BASF under the supply agreement (payment of which are subject to certain conditions) to provide a source of financing for some portion of the cost of the planned construction of our proposed manufacturing plant expected to be located in Statesboro, Georgia, and the potential for BASF to become a significant customer for our products; our joint development agreement with BASF, and the potential for it to support the development of new aerogel products and technologies;
- our beliefs about the usefulness of the square foot operating metric; our beliefs about the financial metrics that are indicative of our core performance;
- our beliefs about the usefulness of our presentation of Adjusted EBITDA; our expectations about the effect of manufacturing capacity on financial metrics such as Adjusted EBITDA;
- our beliefs about the outcome, effects or estimated costs of current or future litigation or their respective timing, including in connection with the Company’s patent enforcement actions;
- our beliefs about the validity of our patents, our expectations about the outcome and timing of the patent enforcement actions; our expectations about hiring additional personnel;
- our plans to devote substantial resources to the development of new aerogel technology;
- our expectations about product mix;

- our expectations about future material costs and manufacturing expenses as a percentage of revenue;
- our expectations of future gross profit and the effect of manufacturing expenses, manufacturing capacity and productivity on gross profit;
- our expectations about our resources and other investments in new technology and related research and development activities and associated expenses;
- our expectations about short and long term (a) research and development (b) general and administrative and (c) sales and marketing expenses;
- our expectations of near term revenue declines; our expectations of revenue growth, increased gross profit, and improving cash flows over the long term;
- our intentions about managing capital expenditures and working capital balances;
- our expectations about incurring significant capital expenditures in the future; our expectations about the expansion of our workforce and resources and its effect on sales and marketing, general and administrative, and related expenses;
- our expectations about future product revenue and demand for our products;
- our expectations about the effect of stock based compensation on various costs and expenses;
- our expectations about potential sources of future financing;
- our beliefs about the impact of accounting policies on our financial statements;
- our beliefs about the effect of interest rates, inflation and foreign currency fluctuations on our results of operations and financial condition; and
- our beliefs about the expansion of our international operations.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important cautionary statements in this prospectus, particularly in the “Risk Factors” section and the risk factors incorporated by reference herein, that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

You should read this prospectus, the documents and reports incorporated by reference in this prospectus, and the documents that we reference in this prospectus and have filed as exhibits to the registration statement of which this prospectus forms a part, completely and with the understanding that our actual future results may be materially different from what we expect. The forward-looking statements contained in this prospectus are made as of the date of this prospectus and the forward-looking statements contained in any document or report incorporated by reference in this prospectus are made as of the dates of such documents or reports. We do not assume, and specifically disclaim, any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise.

USE OF PROCEEDS

We are filing the registration statement of which this prospectus forms a part to permit holders of the shares of our common stock described in the section entitled "Selling Stockholders" to resell such shares. We will not receive any proceeds from the resale of any shares offered by this prospectus by the selling stockholders.

SELLING STOCKHOLDERS

This prospectus covers the resale by the selling stockholders identified below of 6,620,452 shares of our common stock. These shares were issued to the selling stockholders by Aspen Aerogels, Inc. (“Aspen,” “we,” “us” or the “Company”) principally upon conversion of their shares of convertible preferred stock and convertible promissory notes into common stock in connection with our initial public offering of common stock in June 2014 (the “IPO”) or were purchased by certain of those selling stockholders in the IPO. In addition, certain of these shares were issued to members of our board of directors at the time of the IPO as compensation for their service as directors and prior to our filing of a registration statement on Form S-8 registering shares reserved for grant under our 2014 Employee, Director and Consultant Equity Incentive Plan. We are registering the resale of the shares issued upon conversion of convertible preferred stock and convertible promissory notes as required by the Sixth Amended and Restated Registration Rights Agreement that we entered into with the investors named therein, dated as of June 11, 2012, as amended (the “Registration Rights Agreement”). None of our selling stockholders received any of our securities as compensation for underwriting services. We will not receive any proceeds from the resale of the common stock by the selling stockholders.

Except as disclosed in the footnotes below, none of the selling stockholders has been an officer or director of ours or any of our predecessors or affiliates within the past three years. Except as disclosed in the footnotes below, no selling stockholder had a material relationship with the Company or any of its affiliates within the last three years. Except as disclosed in the footnotes below, none of the selling stockholders is affiliated with a broker dealer.

The following table and the accompanying footnotes are based in part on information supplied to us by the selling stockholders. The table and footnotes assume that the selling stockholders will sell all of the shares listed. However, because the selling stockholders may sell all or some of their shares under this prospectus from time to time, or in another permitted manner, we cannot assure you as to the actual number of shares that will be sold by the selling stockholders or that will be held by the selling stockholders after completion of any sales. We do not know how long the selling stockholders will hold the shares before selling them.

Beneficial ownership is determined in accordance with the rules and regulations of the SEC and includes voting or investment power with respect to our common stock. Shares of our common stock subject to options, restricted stock units or warrants that are currently exercisable or exercisable within 60 days of November 1, 2017 are considered outstanding and beneficially owned by the person holding the options, restricted stock units or warrants for the purpose of calculating the percentage ownership of that person but not for the purpose of calculating the percentage ownership of any other person. Except as otherwise noted in the footnotes below, we believe the persons and entities in this table have sole voting and investing power with respect to all of the shares of our common stock beneficially owned by them, subject to community property laws, where applicable. The inclusion of any shares in this table does not constitute an admission of beneficial ownership by the persons named below. The beneficial owners listed below are sorted alphabetically by name.

Selling Stockholder	Shares of Common Stock Beneficially Owned Before this Offering		Number of shares of Common Stock Being Offered	Shares of Common Stock To Be Beneficially owned Upon Completion of this Offering	
	Number	Percentage (1)		Number	Percentage (1)
Contra Costa Capital, LLC (2)	510,787	2.2%	510,787	—	—
GKFF Ventures I, LLC (3)	3,167,322	13.4%	3,167,322	—	—
Reservoir Capital Master Fund, L.P. (4)	251,915	1.1%	251,915	—	—
Reservoir Capital Partners, L.P. (5)	2,644,066	11.2%	2,644,066	—	—
Robert R. Gervis (6)	211,068	*	7,727	203,341	*
Mark L. Noetzel (7)	79,838	*	7,727	72,111	*
William P. Noglows (8)	83,515	*	7,727	75,788	*
Richard R. Reilly (9)	75,894	*	7,727	68,167	*
Steven R. Mitchell (10)	63,494	*	7,727	55,767	*
P. Ramsay Battin (11)	16,935	*	7,727	9,208	*

* Less than one percent (1%).

- (1) Based on a denominator equal to the sum of (i) 23,637,115 shares of our common stock outstanding on November 1, 2017 and (ii) the number of shares of our common stock issuable upon exercise or conversion of convertible securities that are currently exercisable or convertible or are exercisable or convertible within 60 days of November 1, 2017 beneficially owned by the applicable selling stockholder.

- (2) Contra Costa Capital, LLC is an indirect wholly-owned subsidiary of NextEra Energy , Inc. (NYSE: NEE).
- (3) GKFF Ventures I, LLC is managed by Ken Levit and Robert Thomas. George Kaiser Family Foundation (“GKFF”) is the sole equity owner of GKFF Ventures I, LLC. Messrs. Levit and Thomas and GKFF may be deemed to share voting and investment control over the shares, which are beneficially owned by GKFF Ventures I, LLC.
- (4) RCMF, Ltd is the sole Limited Partner of Reservoir Capital Master Fund, L.P. and Reservoir Overseas Partners, L.P. (“RCOP”) is the sole shareholder of RCMF, Ltd. The General Partner of Reservoir Capital Master Fund, L.P. and RCOP is Reservoir Capital Group, L.L.C. whose Managing Member is RCGM, LLC. Daniel Stern and Craig Huff are the Senior Managing Members of RCGM, LLC. Mr. Huff served on our board of directors from February 2005 to August 2009 and from September 2010 to July 2017.
- (5) The General Partner of Reservoir Capital Partners, L.P. is RCP GP, LLC. Reservoir Capital Partners (Cayman), L.P. is the sole Limited Partner of Reservoir Capital Partners, L.P. and the Sole Member of RCP GP, LLC. The General Partner of Reservoir Capital Partners (Cayman) L.P. is Reservoir Capital Group, L.L.C. whose Managing Member is RCGM, LLC. Daniel Stern and Craig Huff are the Senior Managing Members of RCGM, LLC. Mr. Huff served on our board of directors from February 2005 to August 2009 and from September 2010 to July 2017.
- (6) Consists of 111,218 shares of our common stock held by Mr. Gervis, 72,491 shares of our common stock held by the Robert Gervis 2014 Grantor Retained Annuity Trust, of which Mr. Gervis is a beneficiary and his spouse is trustee, and 27,359 shares of our common stock issuable upon the exercise of options exercisable within 60 days following November 1, 2017. Mr. Gervis currently serves on our Board of Directors.
- (7) Consists of 52,043 shares of our common stock held by Mr. Noetzel and 27,795 shares of our common stock issuable upon the exercise of options exercisable within 60 days following November 1, 2017. Mr. Noetzel currently serves on our Board of Directors.
- (8) Consists of 58,467 shares of our common stock held by Mr. Noglows and 25,048 shares of our common stock issuable upon the exercise of options exercisable within 60 days following November 1, 2017. Mr. Noglows currently serves on our Board of Directors.
- (9) Consists of 48,467 shares of our common stock held by Mr. Reilly and 27,427 shares of our common stock issuable upon the exercise of options exercisable within 60 days following November 1, 2017. Mr. Reilly currently serves on our Board of Directors.
- (10) Consists of 38,467 shares of our common stock held by Mr. Mitchell and 25,027 shares of our common stock issuable upon the exercise of options exercisable within 60 days following November 1, 2017. Mr. Mitchell currently serves on our Board of Directors.
- (11) Consists of 16,935 shares of our common stock held by Mr. Battin. Mr. Battin previously served on our Board of Directors until June 15, 2016.

PLAN OF DISTRIBUTION

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- block transactions;
- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- privately negotiated transactions;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- underwritten offerings;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be “underwriters” within the meaning of Section 2(a)(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions under the Securities Act. Selling stockholders who are “underwriters” within the meaning of Section 2(a)(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the names of the selling stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the common stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the selling stockholders and their affiliates. In addition, we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

To the extent required by the Registration Rights Agreement, we have agreed to indemnify certain of the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of certain of the shares offered by this prospectus.

We expect to keep the registration statement of which this prospectus constitutes a part effective for a period of at least eighteen months after the date the registration statement is declared effective by the SEC or, if earlier, until all of the shares covered by this prospectus have been disposed of pursuant to and in accordance with the registration statement.

DESCRIPTION OF CAPITAL STOCK

The following statements are qualified in their entirety by reference to the detailed provisions of our restated certificate of incorporation and restated bylaws.

Authorized Capitalization

We currently have authorized capital stock of 125,000,000 shares of our common stock, par value \$0.00001 per share, and 5,000,000 shares of preferred stock, par value \$0.00001 per share.

As of November 1, 2017, we have 23,637,115 shares of common stock outstanding held of record by 41 stockholders and no shares of preferred stock outstanding.

Common Stock

Holders of our common stock are entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders, and do not have cumulative voting rights. Subject to preferences that may be applicable to any outstanding shares of preferred stock, holders of common stock are entitled to receive ratably such dividends, if any, as may be declared from time to time by our board of directors out of funds legally available for dividend payments. All outstanding shares of common stock are fully paid and nonassessable. The holders of common stock have no preferences or rights of conversion, exchange, pre-emption or other subscription rights. There are no redemption or sinking fund provisions applicable to the common stock. In the event of any liquidation, dissolution or winding-up of our affairs, holders of common stock will be entitled to share ratably in our assets that are remaining after payment or provision for payment of all of our debts and obligations and after liquidation payments to holders of outstanding shares of preferred stock, if any.

Preferred Stock

If we issue preferred stock in the future, such preferred stock would have priority over common stock with respect to dividends and other distributions, including the distribution of assets upon liquidation. Our board of directors has the authority, without further stockholder authorization, to issue from time to time up to 5,000,000 shares of preferred stock in one or more series and to fix the terms, limitations, voting rights, relative rights and preferences and variations of each series. Although we have no present plans to issue any shares of preferred stock, the issuance of shares of preferred stock, or the issuance of rights to purchase such shares, could decrease the amount of earnings and assets available for distribution to the holders of common stock, could adversely affect the rights and powers, including voting rights, of the common stock and could have the effect of delaying, deterring or preventing a change of control of us or an unsolicited acquisition proposal.

Warrants

As of November 1, 2017, we had outstanding warrants to purchase 120 shares of our common stock at an exercise price of \$8.25 per share, which expire on December 29, 2017.

Registration Rights

Pursuant to our registration rights agreement to which certain of our principal stockholders, directors and executive officers are parties, including GKFF Ventures I, LLC; Reservoir Capital Partners, L.P. and affiliated funds; certain entities affiliated with Fidelity Investments; Donald R. Young, our President, Chief Executive Officer and one of our directors; and John F. Fairbanks, our Vice President, Chief Financial Officer and Treasurer, are entitled to registration rights with respect to the shares of common stock held by them. These shares include substantially all of the shares held by GKFF Ventures I, LLC; Reservoir Capital Partners, L.P. and affiliated funds; certain entities affiliated with Fidelity Investments; and certain shares held by Donald R. Young, our President, Chief Executive Officer and one of our directors; and John F. Fairbanks, our Vice President, Chief Financial Officer and Treasurer. We are generally required to pay all expenses incurred in connection with registrations effected in connection with the following rights, excluding underwriting discounts. All registration rights described below will terminate at the earlier of (1) the seventh anniversary of the completion of our initial public offering, or June 18, 2021, (2) such shares have been registered under the Securities Act, such registration statement has been declared

effective and the shares have been disposed of pursuant to such effective registration statement, and (3) with respect to any holder of registrable shares that (together with its affiliates) holds less than 1% of our common stock (on an as-if-converted to common stock basis), when such holder can sell all of such shares without limitation under Rule 144 promulgated under the Securities Act during any 90 day period. The registration statement of which this prospectus forms a part is a shelf registration statement that we are required to file under the registration rights agreement pursuant to the “ – Form S-3 rights” section below.

Demand rights. Subject to specified limitations, the holders representing at least a majority of these registrable shares then outstanding may require that we register all or a portion of these securities for sale under the Securities Act, which we refer to as a demand registration, if the anticipated aggregate offering price of such securities is at least \$10,000,000. We may be required to effect up to two such registrations at our expense and up to two such registrations at the holders’ expense. Stockholders with these registration rights who are not part of an initial registration demand are entitled to notice and are entitled to include their shares of common stock in the registration. Under certain circumstances, the underwriters, if any, may limit the number of shares included in any such registration.

Piggyback rights. If we propose to register any of our equity securities under the Securities Act, other than in connection with (i) a registration relating solely to our employee benefit plans, or (ii) a registration relating solely to a business combination or merger involving us, the holders of these registrable shares are entitled to notice of such registration and are entitled to include their shares of common stock in the registration. Under certain circumstances, the underwriters, if any, may limit the number of shares included in any such registration.

Form S-3 rights. If we become eligible to file registration statements on Form S-3, subject to specified limitations, the holders of these registrable shares may require us to register all or a portion of their registrable shares on Form S-3, if the anticipated aggregate offering price of such securities is at least \$2,000,000. Such requests for registration will not be considered a demand registration pursuant to the “— Demand rights” section above. We are not required to (i) effect more than two such registrations in any 12-month period or (ii) keep effective at any one time more than one registration statement on Form S-3 with respect to the registrable shares. Stockholders with these registration rights who are not part of an initial registration demand are entitled to notice and are entitled to include their shares of common stock in the registration. Under certain circumstances, the underwriters, if any, may limit the number of shares included in any such registration.

Anti-Takeover Effects of Delaware Law and Our Restated Certificate of Incorporation and Restated By-Laws

The provisions of Delaware law, our restated certificate of incorporation and our restated by-laws discussed below could discourage or make it more difficult to accomplish a proxy contest or other change in our management or the acquisition of control by a holder of a substantial amount of our voting stock. It is possible that these provisions could make it more difficult to accomplish, or could deter, transactions that stockholders may otherwise consider to be in their best interests or in our best interests. These provisions are intended to enhance the likelihood of continuity and stability in the composition of our board of directors and in the policies formulated by the board of directors and to discourage certain types of transactions that may involve an actual or threatened change of our control. These provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal and to discourage certain tactics that may be used in proxy fights. Such provisions also may have the effect of preventing changes in our management.

Delaware Statutory Business Combinations Provision

We are subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law. Section 203 prohibits a publicly-held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. For purposes of Section 203, a “business combination” is defined broadly to include a merger, asset sale or other transaction resulting in a financial benefit to the interested stockholder, and, subject to certain exceptions, an “interested stockholder” is a person who, together with his or her affiliates and associates, owns, or within three years prior, did own, 15% or more of the corporation’s voting stock.

Classified Board of Directors; Removal of Directors for Cause

Our restated certificate of incorporation and restated by-laws provide that our board of directors are divided into three classes, with the term of office of the first class to expire at the first annual meeting of stockholders following the initial classification of directors, the term of office of the second class to expire at the second annual meeting of stockholders following the initial classification of directors and the term of office of the third class to expire at the third annual meeting of stockholders following the initial classification of directors. At each annual meeting of stockholders, directors elected to succeed those directors whose terms expire will be elected for a three-year term of office. All directors elected to our classified board of directors will serve until the election and qualification of their respective successors or their earlier resignation or removal. The board of directors is authorized to create new directorships and to fill such positions so created and is permitted to specify the class to which any such new position is assigned. The person filling such position would serve for the term applicable to that class. The board of directors, or its remaining members, even if less than a quorum, is also empowered to fill vacancies on the board of directors occurring for any reason for the remainder of the term of the class of directors in which the vacancy occurred. Members of the board of directors may only be removed for cause and only by the affirmative vote of 75% of our outstanding voting stock. These provisions are likely to increase the time required for stockholders to change the composition of the board of directors. For example, at least two annual meetings will be necessary for stockholders to effect a change in a majority of the members of the board of directors.

Advance Notice Provisions for Stockholder Proposals and Stockholder Nominations of Directors

Our restated by-laws provide that, for nominations to the board of directors or for other business to be properly brought by a stockholder before a meeting of stockholders, the stockholder must first have given timely notice of the proposal in writing to our Secretary. For an annual meeting, a stockholder's notice generally must be delivered not less than 90 days nor more than 120 days prior to the anniversary of the previous year's annual meeting. For a special meeting, the notice must generally be delivered not earlier than the 90th day prior to the meeting and not later than the later of (1) the 60th day prior to the meeting or (2) the 10th day following the day on which public announcement of the meeting is first made. Detailed requirements as to the form of the notice and information required in the notice are specified in the restated by-laws. If it is determined that business was not properly brought before a meeting in accordance with our bylaw provisions, such business will not be conducted at the meeting.

Special Meetings of Stockholders

Special meetings of the stockholders may be called only by our board of directors pursuant to a resolution adopted by a majority of the total number of directors.

No Stockholder Action by Written Consent

Any action to be effected by our stockholders must be effected at a duly called annual or special meeting of the stockholders.

Super Majority Stockholder Vote Required for Certain Actions

The Delaware General Corporation Law provides generally that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or by-laws, unless the corporation's certificate of incorporation or by-laws, as the case may be, requires a greater percentage. Our restated certificate of incorporation requires the affirmative vote of the holders of at least 75% of our outstanding voting stock to amend or repeal any of the provisions discussed in this section of this prospectus entitled "*— Anti-Takeover Effects of Delaware Law and Our Restated Certificate of Incorporation and Restated By-Laws*" or to reduce the number of authorized shares of common stock or preferred stock. This 75% stockholder vote would be in addition to any separate class vote that might in the future be required pursuant to the terms of any preferred stock that might then be outstanding. In addition, a 75% vote is also required for any amendment to, or repeal of, our restated by-laws by the stockholders. Our restated by-laws may be amended or repealed by a simple majority vote of the board of directors.

Exclusive Forum

Our restated certificate of incorporation provides that, subject to limited exceptions, a state or federal court located within the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our by-laws, or (4) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our restated certificate of incorporation described above. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with one or more actions or proceedings described above, a court could find the choice of forum provisions contained in our restated certificate of incorporation to be inapplicable or unenforceable.

Limitation of Directors' and Officers' Liability and Indemnification

The Delaware General Corporation Law authorizes corporations to limit or eliminate, subject to specified conditions, the personal liability of directors to corporations and their stockholders for monetary damages for breach of their fiduciary duties. Our existing restated certificate of incorporation, as amended, limits the liability of our directors to the fullest extent permitted by Delaware law.

We have obtained director and officer liability insurance to cover liabilities our directors and officers may incur in connection with their services to us. Our restated certificate of incorporation and restated by-laws also provide that we will indemnify and advance expenses to any of our directors and officers who, by reason of the fact that he or she is one of our officers or directors, is involved in a legal proceeding of any nature. We will repay certain expenses incurred by a director or officer in connection with any civil, criminal, administrative or investigative action or proceeding, including actions by us or in our name. Such indemnifiable expenses include, to the maximum extent permitted by law, attorney's fees, judgments, fines, ERISA excise taxes, penalties, settlement amounts and other expenses reasonably incurred in connection with legal proceedings. A director or officer will not receive indemnification if he or she is found not to have acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interest.

We have entered into indemnification agreements with each of our non-employee directors and certain officers. These agreements provide that we will, among other things, indemnify and advance expenses to our directors and officers for certain expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by any such person in any investigation, action or proceeding, including any action by us arising out of such person's services as our director or officer, or any other company or enterprise to which the person provides services at our request. We believe that these provisions and agreements are necessary to attract and retain qualified persons as directors and officers.

Such limitation of liability and indemnification does not affect the availability of equitable remedies. In addition, we have been advised that in the opinion of the SEC, indemnification for liabilities arising under the Securities Act is against public policy as expressed in the Securities Act and is therefore unenforceable.

There is no pending litigation or proceeding involving any of our directors, officers, employees or agents in which indemnification will be required or permitted. We are not aware of any threatened litigation or proceeding that may result in a claim for such indemnification.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A., with offices at 250 Royall Street, Canton, Massachusetts 02021.

LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus has been passed upon for us by Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., Boston, Massachusetts.

EXPERTS

The consolidated financial statements and schedule of Aspen Aerogels, Inc. as of December 31, 2016 and 2015, and for each of the years in the three-year period ended December 31, 2016, have been incorporated by reference herein and in the registration statement in reliance upon the reports of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the information requirements of the Exchange Act, and are required to file annual, quarterly and current reports, proxy statements, information statements and other information with the SEC. You may read and copy this information, for a copying fee, at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549 on official business days during the hours of 10:00 a.m. to 3:00 p.m. Please call the SEC at 1-800-SEC-0330 for more information on its Public Reference Room. Our SEC filings are also available to the public from commercial document retrieval services, and at the website maintained by the SEC at <http://www.sec.gov>.

We also maintain a website at <http://www.aerogel.com>, through which you can access our filings with the SEC. Information contained on or accessible from our website does not constitute part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

This prospectus is part of a registration statement that we filed with the SEC. The registration statement contains more information than this prospectus regarding us and the securities, including exhibits and schedules. You can obtain a copy of the registration statement from the SEC at any address listed above or from the SEC's website.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus information that we have filed with the SEC. This means we can disclose important information to you by referring you to other documents that contain that information. The information incorporated by reference is considered part of this prospectus. We incorporate by reference the documents listed below:

- (1) Our Annual Report on Form 10-K for the fiscal year ended December 31, 2016 that we filed with the SEC on March 2, 2017;
- (2) The portions of our definitive proxy statement on Schedule 14A filed with the SEC on April 26, 2017 that are deemed “filed” with the SEC under the Exchange Act;
- (3) Our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2017 that we filed with the SEC on May 5, 2017, our Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 2017 that we filed with the SEC on August 4, 2017 and our Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2017 that we filed with the SEC on November 3, 2017 ;
- (4) Our Current Reports on Form 8-K that we filed with the SEC on January 30, 2017, June 14, 2017, August 3, 2017 and October 2, 2017 (except for the information furnished under Items 2.02 or 7.01 and the exhibits furnished thereto);
- (5) the description of our common stock contained in our Registration Statement on Form 8-A filed on June 6, 2014, including any amendment or report filed for the purpose of updating such description; and
- (6) all reports and other documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act after the date of this prospectus and prior to the termination or completion of the offering of securities under this prospectus shall be deemed to be incorporated by reference in this prospectus and to be a part hereof from the date of filing such reports and other documents.

Any statement contained in this prospectus or in a document incorporated or deemed to be incorporated by reference into this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus modifies or supersedes the statement. Any statements so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

You may request a copy of these documents, orally or in writing, which will be provided to you at no cost, by contacting:

Aspen Aerogels, Inc.
30 Forbes Road, Building B
Northborough, Massachusetts 01532
Attention: Investor Relations
Telephone: (508) 691-1111

You may also access these documents on our website, <http://www.aerogel.com>.

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth the fees and expenses incurred and to be incurred in connection with the registration of the securities being registered hereby, all of which will be borne by us. Except for the SEC registration fee, all amounts are estimates.

Description	Amount
SEC registration fee	\$ 3,672.02
Printing expense	1,000.00
Accounting fees and expenses	20,000.00
Legal fees and expenses	50,000.00
Total expenses	\$ 74,672.02

Item 15. Indemnification of Directors and Officers

Delaware Law

Our restated certificate of incorporation and restated by-laws provide that each person who was or is made a party or is threatened to be made a party to or is otherwise involved (including, without limitation, as a witness) in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he or she is or was one of our directors or officers or is or was serving at our request as a director, officer or trustee of another corporation, or of a partnership, joint venture, trust or other enterprise, including service with respect to an employee benefit plan, whether the basis of such proceeding is alleged action in an official capacity as a director, officer or trustee or in any other capacity while serving as a director, officer or trustee, shall be indemnified and held harmless by us to the fullest extent authorized by the Delaware General Corporation Law against all expense, liability and loss (including attorneys' fees, judgments, fines, ERISA excise taxes or penalties and amounts paid in settlement) reasonably incurred or suffered by such.

Section 145 of the Delaware General Corporation Law permits a corporation to indemnify any director or officer of the corporation against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with any action, suit or proceeding brought by reason of the fact that such person is or was a director or officer of the corporation, if such person acted in good faith and in a manner that he or she reasonably believed to be in, or not opposed to, the best interests of the corporation, and, with respect to any criminal action or proceeding, if he or she had no reasonable cause to believe his or her conduct was unlawful. In a derivative action (i.e., one brought by or on behalf of the corporation), indemnification may be provided only for expenses actually and reasonably incurred by any director or officer in connection with the defense or settlement of such an action or suit if such person acted in good faith and in a manner that he or she reasonably believed to be in, or not opposed to, the best interests of the corporation, except that no indemnification shall be provided if such person shall have been adjudged to be liable to the corporation, unless and only to the extent that the Delaware Chancery Court or the court in which the action or suit was brought shall determine that such person is fairly and reasonably entitled to indemnity for such expenses despite such adjudication of liability.

Pursuant to Section 102(b)(7) of the Delaware General Corporation Law, Article VI of our restated certificate of incorporation eliminates the liability of a director to us or our stockholders for monetary damages for such a breach of fiduciary duty as a director, except for liabilities arising:

- from any breach of the director's duty of loyalty to us or our stockholders;
- from acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- under Section 174 of the Delaware General Corporation Law; and
- from any transaction from which the director derived an improper personal benefit.

We have entered into indemnification agreements with our non-employee directors and certain executive officers, in addition to the indemnification provided for in our restated certificate of incorporation and restated by-laws, and intend to enter into indemnification agreements with any new directors and executive officers in the future. We have purchased and intend to maintain insurance on behalf of any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in any such capacity, subject to certain exclusions.

The foregoing discussion of our restated certificate of incorporation, restated by-laws, indemnification agreements and Delaware law is not intended to be exhaustive and is qualified in its entirety by such restated certificate of incorporation, restated by-laws, indemnification agreements or law.

Reference is made to our undertakings in Item 17 with respect to liabilities arising under the Securities Act.

Item 16. Exhibits

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Filed with this Report	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
4.1	Restated Certificate of Incorporation of the Registrant, as filed with the Secretary of State of the State of Delaware on June 18, 2014.		Form 8-K (Exhibit 3.2)	6/19/14	001-36481
4.2	Restated Bylaws of Aspen Aerogels, Inc.		Form 8-K (Exhibit 3.3)	6/19/14	001-36481
4.3	Form of common stock certificate.		Amendment No. 1 to Form S-1 (Exhibit 4.1)	5/14/14	333-195523
4.4	Form of warrant to purchase common stock issued by the Registrant in connection with the 2010 subordinated note and warrant financing.		Form S-1 (Exhibit 4.6)	4/28/14	333-195523
4.5	Sixth amended and restated registration rights agreement, dated as of June 11, 2012, by and among the Registrant and the investors named therein, as amended.		Form S-1 (Exhibit 4.8)	4/28/14	333-195523
5.1	Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.	X			
23.1	Consent of KPMG LLP.	X			
23.2	Consent of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. (included in Exhibit 5.1).	X			
24.1	Powers of Attorney (included on signature page to this registration statement).	X			

Item 17. Undertakings

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

Provided, however, that Paragraphs (a)(1)(i), (ii) and (iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to section 13 or section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser:

(i) Each prospectus filed by the Registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such

effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the Town of Northborough, Commonwealth of Massachusetts, on November 7, 2017.

ASPEN AEROGELS, INC.

By: /s/ Donald R. Young

Donald R. Young

President and Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned officers and directors of Aspen Aerogels, Inc., hereby severally constitute and appoint Donald R. Young and John F. Fairbanks, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as she or he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or her or his substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Name</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Donald R. Young</u> Donald R. Young	President, Chief Executive Officer (Principal Executive Officer) and Director	November 7, 2017
<u>/s/ John F. Fairbanks</u> John F. Fairbanks	Vice President, Chief Financial Officer and Treasurer (Principal Financial Officer and Principal Accounting Officer)	November 7, 2017
<u>/s/ Mark L. Noetzel</u> Mark L. Noetzel	Chairman of the Board	November 7, 2017
<u>/s/ Rebecca A. Blalock</u> Rebecca Blalock	Director	November 7, 2017
<u>/s/ Robert M. Gervis</u> Robert M. Gervis	Director	November 7, 2017
<u>/s/ Steven R. Mitchell</u> Steven R. Mitchell	Director	November 7, 2017
<u>/s/ William P. Noglows</u> William P. Noglows	Director	November 7, 2017
<u>/s/ Richard F. Reilly</u> Richard F. Reilly	Director	November 7, 2017

MINTZ LEVIN

One Financial Center
Boston , MA 02111
617-542-6000
617-542-2241 fax
www.mintz.com

November 7, 2017

Aspen Aerogels, Inc.
30 Forbes Road, Building B
Northborough, MA 01532

Ladies and Gentlemen:

We have acted as legal counsel to Aspen Aerogels, Inc., a Delaware corporation (the “Company”), in connection with the preparation and filing with the Securities and Exchange Commission (the “Commission”) of a Registration Statement on Form S-3 (the “Registration Statement”) under the Securities Act of 1933, as amended (the “Securities Act”). The Registration Statement relates to the registration for resale by the selling stockholders named in the Registration Statement (the “Selling Stockholders”) of up to an aggregate of 6,620,452 shares of the Company’s common stock, \$0.00001 par value per share (“Common Stock”), issued to the Selling Stockholders (the “Shares”). This opinion is being rendered in connection with the filing of the Registration Statement with the Commission. All capitalized terms used herein and not otherwise defined shall have the respective meanings given to them in the Registration Statement.

In connection with this opinion, we have examined and relied upon the Certificate of Incorporation and Bylaws of the Company, each as restated and/or amended to date; such other records of the corporate proceedings of the Company and certificates of the Company’s officers as we have deemed relevant; and the Registration Statement and the exhibits thereto.

In our examination, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified or photostatic copies and the authenticity of the originals of such copies.

Our opinion is limited to the General Corporation Law of the State of Delaware and we express no opinion with respect to the laws of any other jurisdiction. No opinion is expressed herein with respect to the qualification of the Shares under the securities or blue sky laws of any state or any foreign jurisdiction.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters. This opinion is based upon currently existing statutes, rules, regulations and judicial decisions, and we disclaim any obligation to advise you of any change in any of these sources of law or subsequent legal or factual developments which might affect any matters or opinions set forth herein.

Based upon the foregoing, we are of the opinion that the Shares are validly issued, fully paid and non-assessable.

We understand that you wish to file this opinion with the Commission as an exhibit to the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K promulgated under the Securities Act and to reference the firm’s name under the caption “Legal Matters” in the prospectus which forms part of the Registration Statement, and we hereby consent thereto. In giving this consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission promulgated thereunder.

Very truly yours,

/s/ Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

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Aspen Aerogels, Inc.

November 7, 2017

Page 2

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Aspen Aerogels, Inc.:

We consent to the use of our reports dated March 2, 2017, with respect to the consolidated balance sheets of Aspen Aerogels, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2016, and the related financial statement schedule, incorporated herein by reference and to the reference to our firm under the heading "Experts" in the prospectus.

/s/ KPMG LLP
Boston, Massachusetts
November 6, 2017