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

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended June 30, 2018

OR

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

For the transition period from to

Commission file number: 001-36481

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 No.)**
30 Forbes Road, Building B **Northborough, Massachusetts** **(Address of principal executive offices)**	**01532** **(Zip Code)**

Registrant's telephone number, including area code: (508) 691-1111

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

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

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

Large accelerated filer	☐		Accelerated filer	☒
Non-accelerated filer	☐	(Do not check if a smaller reporting company)	Smaller reporting company	☐
			Emerging growth company	☒

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

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

As of August 1, 2018, the registrant had 23,940,315 shares of common stock outstanding.

ASPEN AEROGELS, INC.

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Trademarks, Trade Names and Service Marks

We own or have rights to use "Aspen Aerogels," "Cryogel," "Pyrogel," "Spaceloft," the Aspen Aerogels logo and other trademarks, service marks and trade names of Aspen Aerogels, Inc. appearing in this Quarterly Report on Form 10-Q. Solely for convenience, the trademarks, service marks and trade names referred to in this report are presented without the ® and TM symbols, but such references are not intended to indicate, in any way, that the owner thereof will not assert, to the fullest extent under applicable law, such owner's rights to these trademarks, service marks and trade names. This report contains additional trademarks, service marks and trade names of other companies, which, to our knowledge, are the property of their respective owners.

PART I — FINANC IAL INFORMATION

Item 1. Financial Statements.

ASPEN AEROGELS, INC.

Consolidated Balance Sheets

(Unaudited)

	June 30, 2018	December 31, 2017
	(In thousands, except share and per share data)	
Assets		
Current assets:		
Cash and cash equivalents	$ 7,286	$ 10,694
Accounts receivable, net of allowances of $270 and $93	20,106	26,764
Inventories	12,822	8,915
Prepaid expenses and other current assets	1,190	1,289
Total current assets	41,404	47,662
Property, plant and equipment, net	71,988	76,067
Other long-term assets	79	86
Total assets	$ 113,471	$ 123,815
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 8,395	$ 10,653
Accrued expenses	4,710	5,862
Revolving line of credit	3,750	3,750
Deferred revenue	1,540	1,304
Total current liabilities	18,395	21,569
Deferred rent	1,235	1,303
Prepayment liability	3,989	—
Deferred revenue long-term	927	—
Total liabilities	24,546	22,872
Commitments and contingencies (Note 7)		
Stockholders' equity:		
Preferred stock, $0.00001 par value; 5,000,000 shares authorized, no shares issued and outstanding at June 30, 2018 and December 31, 2017	—	—
Common stock, $0.00001 par value; 125,000,000 shares authorized, 23,940,315 and 23,643,189 shares issued and outstanding at June 30, 2018 and December 31, 2017, respectively	—	—
Additional paid-in capital	539,870	538,088
Accumulated deficit	(450,945)	(437,145)
Total stockholders' equity	88,925	100,943
Total liabilities and stockholders' equity	$ 113,471	$ 123,815

See accompanying notes to unaudited consolidated financial statements.

ASPEN AEROGELS, INC.

Consolidated Statements of Operations

(Unaudited)

	Three Months Ended June 30, 2018	Three Months Ended June 30, 2017	Six Months Ended June 30, 2018	Six Months Ended June 30, 2017
	(In thousands, except share and per share data)			
Revenue:				
Product	$ 21,115	$ 24,562	$ 43,636	$ 46,888
Research services	556	507	1,109	1,183
Total revenue	21,671	25,069	44,745	48,071
Cost of revenue:				
Product	18,676	21,121	38,699	41,591
Research services	251	254	492	565
Gross profit	2,744	3,694	5,554	5,915
Operating expenses:				
Research and development	1,638	1,709	3,243	3,285
Sales and marketing	3,721	3,416	7,220	6,526
General and administrative	4,240	4,002	8,696	10,589
Total operating expenses	9,599	9,127	19,159	20,400
Loss from operations	(6,855)	(5,433)	(13,605)	(14,485)
Interest expense, net	(103)	(39)	(195)	(65)
Total interest expense, net	(103)	(39)	(195)	(65)
Net loss	$ (6,958)	$ (5,472)	$ (13,800)	$ (14,550)
Net loss per share:				
Basic and diluted	$ (0.29)	$ (0.23)	$ (0.58)	$ (0.62)
Weighted-average common shares outstanding:				
Basic and diluted	23,743,358	23,369,179	23,655,676	23,313,668

See accompanying notes to unaudited consolidated financial statements.

ASPEN AEROGELS, INC.

Consolidated Statements of Cash Flows

(Unaudited)

	Six Months Ended June 30, 2018	Six Months Ended June 30, 2017
	(In thousands)	
Cash flows from operating activities:		
Net loss	$ (13,800)	$ (14,550)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	5,686	5,306
Stock-compensation expense	2,286	2,618
Lease incentives	(60)	(49)
Accretion of prepayment discount	43	—
Other	—	(1)
Changes in operating assets and liabilities:		
Accounts receivable	6,658	1,518
Inventories	(3,907)	(387)
Prepaid expenses and other assets	106	349
Accounts payable	(2,208)	(1,272)
Accrued expenses	(1,138)	813
Deferred revenue	109	(237)
Deferred rent	(22)	(111)
Net cash used in operating activities	(6,247)	(6,003)
Cash flows from investing activities:		
Capital expenditures	(1,657)	(4,831)
Net cash used in investing activities	(1,657)	(4,831)
Cash flows from financing activities:		
Proceeds from borrowings under line of credit	12,116	—
Repayment of borrowings under line of credit	(12,116)	—
Prepayment proceeds under customer supply agreement, net	5,000	—
Repayment of obligations under capital lease	—	(15)
Payments made for employee restricted stock tax withholdings	(504)	(286)
Net cash provided by (used in) financing activities	4,496	(301)
Net decrease in cash	(3,408)	(11,135)
Cash at beginning of period	10,694	18,086
Cash at end of period	$ 7,286	$ 6,951
Supplemental disclosures of cash flow information:		
Interest paid	$ 141	$ 89
Income taxes paid	$ —	$ —
Supplemental disclosures of non-cash activities:		
Changes in accrued capital expenditures	$ (50)	$ (3,385)
Deferred revenue	$ 1,036	$ —
Capitalized interest	$ 9	$ —

See accompanying notes to unaudited consolidated financial statements.

(1) Description of Business and Basis of Presentation

Nature of Business

Aspen Aerogels, Inc. (the Company) is an aerogel technology company that designs, develops and manufactures innovative, high-performance aerogel insulation used primarily in the energy infrastructure and building materials markets. The Company also conducts research and development related to aerogel technology supported by funding from several agencies of the U.S. government and other institutions in the form of research and development contracts.

The Company maintains its corporate offices in Northborough, Massachusetts. The Company has three wholly owned subsidiaries: Aspen Aerogels Rhode Island, LLC, Aspen Aerogels Germany, GmbH and Aspen Aerogels Georgia, LLC.

Liquidity

In August 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014‑15, Presentation of Financial Statements-Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern (ASU 2015-14). This ASU requires management to assess and evaluate whether conditions or events exist, considered in the aggregate, that raise substantial doubt about the entity's ability to continue as a going concern within one year after the financial statements issue date. The Company adopted this standard effective January 1, 2017.

At June 30, 2018, the Company had a cash and cash equivalents balance of $7.3 million and $3.8 million of outstanding borrowings under its revolving line of credit (see note 7). The existing revolving line of credit matures on April 28, 2019.

The Company is making investments to increase capacity at its existing manufacturing facility in East Providence, Rhode Island, to expand its sales and marketing efforts, and to develop new technologies and business opportunities. The Company expects its existing cash balance and the amount anticipated to be available under the existing revolving line of credit will be sufficient to fund a portion of these investments. The Company plans to manage capital expenditures and working capital balances to maintain the cash resources required to support current operating requirements and the initial phases of the capacity expansion plan.

Beyond 2018, the Company will need to supplement its cash balance with anticipated cash flows from operations, local government grants, debt financings, customer prepayments, technology licensing agreements and equity financings, if necessary, to provide the capital required to complete the expansion of the existing manufacturing facility and to fund its strategic business initiatives.

Unaudited Interim Financial Information

The accompanying unaudited interim consolidated financial statements include the accounts of the Company and have been prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and with the instructions to Form 10-Q and Article 10 of Regulation S-X. Certain information and disclosures normally included in the consolidated financial statements prepared in accordance with U.S. GAAP have been condensed or omitted pursuant to such rules and regulations. As such, the information included in this Quarterly Report on Form 10-Q should be read in conjunction with the audited consolidated financial statements and accompanying notes in our Annual Report on Form 10-K for the year ended December 31, 2017 (the Annual Report), filed with the Securities and Exchange Commission on March 1, 2018.

In the opinion of the Company's management, the unaudited interim consolidated financial statements have been prepared on the same basis as the audited consolidated financial statements and include all adjustments that are of a normal recurring nature and necessary for the fair statement of the Company's financial position as of June 30, 2018 and the results of its operations for the six months ended June 30, 2018 and 2017 and the cash flows for the six month periods then ended. The Company has evaluated events through the date of this filing.

The results of operations for the three and six months ended June 30, 2018 are not necessarily indicative of the results to be expected for the year ending December 31, 2018 or any other period.

(2) Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements, which have been prepared in accordance with U.S. GAAP, include the accounts of the Company and its wholly owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of the consolidated financial statements requires the Company to make a number of estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to such estimates and assumptions include allowances for doubtful accounts, sales returns and allowances, product warranty costs, inventory valuation, the carrying amount of property and equipment, stock-based compensation and deferred income taxes. The Company evaluates its estimates and assumptions on an on-going basis using historical experience and other factors, including the current economic environment, which are believed to be reasonable under the circumstances. Management adjusts such estimates and assumptions when facts and circumstances warrant. Illiquid credit markets, volatile equity markets and declines in business investment increase the uncertainty inherent in such estimates and assumptions. As future events and their effects cannot be determined with precision, actual results could differ significantly from these estimates. Changes in these estimates resulting from continuing changes in the economic environment will be reflected in the financial statements in future periods.

Cash and Cash Equivalents

Cash equivalents include short-term, highly liquid instruments, which consist of money market accounts. All cash and cash equivalents are maintained with major financial institutions in North America. Deposits with these financial institutions may exceed the amount of insurance provided on such deposits; however, these deposits typically may be redeemed upon demand and, therefore, bear minimal risk.

Revenue Recognition

On January 1, 2018, the Company adopted Accounting Standards Codification 606, Revenue from Contracts with Customers (ASC 606). See note 3 for further details.

The Company recognizes revenue from the sale of products and performance of research and development services. Revenue is recognized when a customer obtains control of promised goods or services, in an amount that reflects the consideration which the Company expects to receive in exchange from those goods or services.

Sales returns are recorded based on historical sales and return information. Products that exhibit unusual sales return patterns due to quality or other manufacturing matters are specifically investigated and analyzed as part of the sales return accrual. The sales return accrual represents a reserve for products that may be returned due to quality concerns or authorized for destruction in the field. Sales return reserves are recorded at full original sales value. The Company rarely exchanges products from inventory for returned products. Sales return and other credit reserves were $0.3 million and $0.1 million at June 30, 2018 and December 31, 2017, respectively.

Stock-based Compensation

Stock-based compensation expense is measured at the grant date based on the fair value of the award. Expense is recognized on a straight-line basis over the requisite service period for all awards with service conditions. For performance-based awards, the grant date fair value is recognized as expense when the condition is probable of being achieved, and then on a graded basis over the requisite service period. The Company uses the Black-Scholes option-pricing model to determine the fair value of service-based option awards, which requires a number of complex and subjective assumptions including fair value of the underlying security, the expected volatility of the underlying security, a risk-free interest rate and the expected term of the option. The fair value of restricted stock and restricted stock unit grants is determined using the closing trading price of the Company's common stock on the date of grant. The fair value of awards containing market conditions is determined using a Monte Carlo simulation model based upon the terms of the conditions, the expected volatility of the underlying security, and other relevant factors.

During the six months ended June 30, 2018, the Company granted 58,062 shares of restricted common stock with a grant date fair value of $0.3 million and 81,102 non-qualified options (NSOs) to purchase shares of common stock with a grant date fair value of $0.4 million vesting over a period of one year to its non-employee directors under the 2014 Employee, Director and Consultant Equity

Incentive Plan (the 2014 Equity Plan). During the six months ended June 30, 2018 , the Company also granted 497,910 restricted common stock units (RSUs) with a grant date fair value of $2.3 millio n and 493,154 NSOs to purchase shares of common stock with a grant date fair value of $1.1 million to employees under the 2014 Equity Plan . The RSUs and NSOs granted to employees vest over a three year period.

Stock-based compensation is included in cost of revenue or operating expenses, as applicable, and consists of the following:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(In thousands)			
Cost of product revenue	$ 162	$ 236	$ 316	$ 440
Research and development expenses	120	160	231	298
Sales and marketing expenses	209	303	441	571
General and administrative expenses	659	675	1,298	1,309
Total stock-based compensation	$ 1,150	$ 1,374	$ 2,286	$ 2,618

Pursuant to the "evergreen" provisions of the 2014 Equity Plan, the number of shares of common stock authorized for issuance under the plan automatically increased by 472,863 shares to 7,009,460 shares effective January 1, 2018.

As of June 30, 2018, 3,866,557 shares of common stock were reserved for issuance upon the exercise or vesting, as appropriate, of outstanding stock-based awards granted under the 2014 Equity Plan. In addition, as of June 30, 2018, 90,288 shares of common stock were reserved for issuance upon the exercise of outstanding stock options granted under the Company's 2001 Equity Incentive Plan, as amended (the 2001 Equity Plan). Any cancellations or forfeitures of the options outstanding under the 2001 Equity Plan will result in the shares reserved for issuance upon exercise of such options becoming available for grant under the 2014 Equity Plan. As of June 30, 2018, there were 1,771,735 shares of common stock available for future grant under the 2014 Equity Plan.

Earnings per Share

The Company calculates net loss per common share based on the weighted-average number of common shares outstanding during each period. Potential common stock equivalents are determined using the treasury stock method. The weighted-average number of common shares included in the computation of diluted net loss gives effect to all potentially dilutive common equivalent shares, including outstanding stock options, RSUs and warrants. Common equivalent shares are excluded from the computation of diluted net loss per share if their effect is antidilutive.

Segments

Operating segments are identified as components of an enterprise about which separate, discrete financial information is available for evaluation by the chief operating decision maker in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the Chief Executive Officer. The Company's chief operating decision maker reviews consolidated operating results to make decisions about allocating resources and assessing performance for the entire Company. The Company views its operations and manages its business as one operating segment.

Information about the Company's total revenues, based on shipment destination or services location, is presented in the following table:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(In thousands)			
Revenue:				
U.S.	$ 9,310	$ 10,131	$ 19,192	$ 19,261
International	12,361	14,938	25,553	28,810
Total	$ 21,671	$ 25,069	$ 44,745	$ 48,071

Warranty Costs

The Company provides warranties for its products and records the estimated cost within cost of revenue in the period that the related revenue is recorded. The Company's standard warranty period extends to one year from the date of shipment. This standard warranty provides that the Company's products will be free from defects in material and workmanship, and will, under normal use, conform to the specifications for the product.

The Company's products may be utilized in systems that involve new technical demands and new configurations. Accordingly, the Company regularly reviews and assesses whether warranty reserves should be recorded in the period that the related revenue is recorded. For an initial shipment of product for use in a system with new technical demands or new configurations and where the Company is unsure of meeting the customer's specifications, the Company will defer the recognition of product revenue and related costs until written customer acceptance is obtained.

The Company performs periodic testing of its aerogel blankets to ensure compliance with published performance specifications. From time to time, tests may indicate a product could potentially perform outside of these specifications. At that time, additional testing is initiated or the Company may conduct a root cause investigation. During the six months ended June 30, 2018, a test result indicated that tested samples performed outside the published performance specifications for a specific attribute of a product and, as a result, the Company performed additional testing. The Company has determined that it is probable it has incurred a liability, however, the liability is not estimable as of June 30, 2018. The Company will continue to assess the impact of the testing results on its customer base and, depending on the assessment, could be subject to material warranty charges in future periods.

The Company did not record any warranty expense during the six months ended June 30, 2018. During the six months ended June 30, 2017 the Company recorded warranty expense of $0.9 million. This specific warranty charge was related to product claims for a single product application issue. As of June 30, 2018, the Company had satisfied all outstanding warranty claims .

Recently Issued Accounting Standards

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies. Recently issued standards typically do not require adoption until a future effective date. Prior to their effective date, the Company evaluates the pronouncements to determine the potential effects of adoption to its consolidated financial statements.

Standards Implemented Since December 31, 2017

In August 2015, the FASB issued a deferral of ASU 2014-09, Revenue from Contracts with Customers. The standard replaced the transaction- and industry-specific revenue recognition guidance under current U.S. GAAP with a principle based approach for determining revenue recognition. As a result of the deferral, public entities were required to apply the revised revenue recognition standard for the annual reporting period beginning on or after December 15, 2017, including interim periods within that annual reporting period. The Company adopted this standard using the modified retrospective method on January 1, 2018. The Company completed its analysis of the new revenue standard and determined that it would not materially impact the allocation and timing of recognition of previously reported revenues from the sale of products or performance of research and development services. In addition, the Company determined that there were no incremental contract costs or contract fulfillment costs to be recognized in connection with the adoption. Based on the Company's analysis, no adjustment to retained earnings was required as of the January 1, 2018 adoption date. Accordingly, the Company's application of the standard did not have a material impact on the Company's consolidated balance sheet at January 1, 2018 and did not have a material impact to its statement of operations for the six months ended June 30, 2018, and 2017 or the twelve months ended December 31, 2017.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments (ASU 2016-15). This amendment addresses eight classification issues related to the statement of cash flows. The amendments in ASU 2016-15 are effective for public business entities for annual and interim periods in fiscal years beginning after December 15, 2017. The Company adopted the provisions of the amendment on January 1, 2018. The adoption of the standard has not resulted in any material impact to the Company's consolidated financial statements or other disclosures.

Standards to be Implemented

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842) . FASB ASU 2016-02 modifies the accounting for leases and requires that all leases be recorded on the consolidated balance sheets as assets and liabilities. This standard is effective for fiscal years beginning after December 15, 2018. Early application is permitted. The Company has not yet selected a transition method and is evaluating the effect the updated standard will have on its consolidated financial statements and related disclosures. The Company currently expects that most of its operating lease commitments will be subject to the new standard and recognized as right-of-use assets and operating lease liabilities. The Company expects application of the standard will increase the reported value of both total assets and total liabilities upon adoption and will have a material impact on the Company's consolidated financial statements and other disclosures. Additionally, the Company is in the process of updating its systems, controls and procedures for maintaining and accounting for its lease portfolio under the new standard. The Company expects to adopt the new standard on January 1, 2019.

(3) Revenue from Contracts with Customer s

On January 1, 2018, the Company adopted Accounting Standards Codification 606, Revenue from Contracts with Customers (ASC 606) using the modified retrospective method for all contracts not completed as of the date of adoption. The adoption of ASC 606 did not have a material impact on the allocation and timing of the recognition of previously reported revenues from the sale of products, subsea projects or performance of research and development services. For the six months ended June 30, 2018, there was no difference in the accounting for revenue transactions under ASC 606 or ASC 605, Revenue Recognition (ASC 605). In addition, the Company determined that there are no incremental contract costs or contract fulfillment costs associated with the adoption. The reported results for 2018 reflect the application of ASC 606 guidance while the reported results for 2017 were prepared under the guidance of ASC 605. The adoption of ASC 606 represents a change in accounting principle that more closely aligns revenue recognition with the delivery of the Company's product or research services and will provide financial statement readers with enhanced disclosures.

Revenue Recognition

Revenue is recognized when a customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange from those goods or services. To determine revenue recognition for arrangements within the scope of ASC 606, the Company performs the following five steps: (i) identification of the contract with a customer; (ii) identification of the performance obligations in the contract; (iii) determination of the transaction price; (iv) allocation of the transaction price to the separate performance obligations in the contract; and (v) recognition of the revenue associated with performance obligation as they are satisfied. The Company applies the five-step model to contracts when it is probable that the Company will collect the consideration it is entitled to in exchange for the goods or services it transfers to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within each contract and determines those that are performance obligations, and assesses whether each promised good or service is distinct. If the contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price based on the estimated relative standalone selling prices of the promised products or services underlying each performance obligation. The Company determines standalone selling prices based on the price at which the performance obligation is sold separately. If the standalone selling price is not observable through past transactions, the Company estimates the standalone selling price taking into account available information such as market conditions and internally approved pricing guidelines related to the performance obligations. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

When determining the transaction price of a contract, an adjustment is made if payment from a customer occurs either significantly before or significantly after performance, resulting in a significant financing component. Applying the practical expedient in paragraph ASC 606-10-32-18, the Company does not assess whether a significant financing component exists if the period between when the Company performs its obligations under the contract and when the customer pays is one year or less. The Company did not have any contracts outstanding at January 1, 2018 and did not enter into any contracts during the six months ended June 30, 2018 that contained a significant financing component.

The Company records deferred revenue for product sales when the Company has delivered products but other performance obligations have not been satisfied or control has not been transferred to the customer.

Shipping and Handling Costs

Shipping and handling costs associated with outbound freight after control over a product has transferred to a customer are accounted for as fulfillment costs and are included in the cost of product revenue. The amount of revenue recognized reflects the consideration to which the Company expects to be entitled to receive in exchange for these products or research services.

Product Revenue

The Company generally enters into contracts containing one type of performance obligation. The Company recognizes product revenue when the performance obligation is satisfied, which is generally upon delivery according to contractual shipping terms within customer purchase orders.

The Company also enters into rebate agreements with certain customers. These agreements may be considered an additional performance obligation of the Company or variable consideration within a contract. Rebates are recorded as a reduction of revenue in the period the related product revenue is recognized. A corresponding liability is recorded as a component of deferred revenue on the consolidated balance sheets. These arrangements are primarily based on the customer attaining contractually specified sales volumes.

The Com pany estimates the amount of it s product sales that may be returned by its customers and records this estimate as a reduction of revenue in the period the related product revenue is recognized. Th e Company currently estimates product return liabilities using historical rates of return, current quarter credit sales, and specific items of exposure on a contract by contract basis.

Subsea Projects

The Company manufactures and sells subsea products that are designed for pipe-in-pipe applications in offshore oil production and are typically customized to meet customer specifications. Subsea products typically have no alternative use and contain an enforceable right to payment. Customer invoicing terms for subsea products are typically based on certain milestones within the production and delivery schedule. Under the provisions of ASC 606, the Company recognizes revenue at a point in time when transfer of control of the products is passed to the customer, or over time utilizing the input/cost-to-cost method. The timing of revenue recognition is assessed on a contract by contract basis. During the six months ended June 30, 2018, the Company recognized $0.8 million in connection with subsea projects.

Other Revenue

The Company is party to an amended and restated supply agreement with BASF Polyurethanes GmbH (BASF) (the Supply Agreement) and a joint development agreement with BASF SE (the JDA) (see note 7). Pursuant to the Supply Agreement, the Company will sell exclusively to BASF the Company's Spaceloft A2 product at annual volumes to be specified by BASF, subject to certain volume limits. The Company has determined that the exclusivity component of the Supply Agreement represents a performance obligation to BASF that will be satisfied over time. The Company will calculate the value of the exclusivity component upon receipt of prepayments from BASF. Revenue associated with this performance obligation will be recognized over the term of the agreement which expires on December 31, 2027.

During the six months ended June 30, 2018, BASF made two prepayments of $2.5 million each. At the time of the receipt of the prepayments, the Company calculated and accounted for the value associated with exclusivity component as deferred revenue. The value associated with the exclusivity component was approximately $0.5 million for each prepayment.

During the six months ended June 30, 2018, the Company recognized less than $0.1 million in revenue associated with the exclusive right to sell Spaceloft A2 which is recorded as a component of product revenue in the Company's consolidated statement of operations. At June 30, 2018, deferred revenue related to the exclusivity component of the Supply Agreement totaled $1.0 million. There was no deferred revenue related to the Supply Agreement at December 31, 2017.

Research Services

The Company performs research services under contracts with various government agencies and other institutions. These contracts generally have one type of performance obligation associated with the provision of research services including functional licenses to any resulting intellectual property. The Company records revenue using the percentage-of-completion method in two ways: (1) for firm-fixed-price contracts, the Company accrues that portion of the total contract price that is allocable on the basis of the Company's estimates of costs incurred to date to total contract costs; and (2) for cost-plus-fixed-fee contracts, the Company records revenue that is equal to total payroll cost incurred times a stated factor plus reimbursable expenses, to a stated upper limit. The primary cost under the Company's research service contacts is the labor effort expended in completing the research, and the only deliverable, other than the labor hours expended, is the reporting of research results to the customer. Because the input measure of labor hours expended is also reflective of the output measure, it is a reliable means to measure the extent of progress toward completion. Revisions in cost estimates and fees during the course of the contract are reflected in the accounting period in which the facts that require the revisions become known. Contract costs and rates used to allocate overhead to contracts are subject to audit by the respective contracting government agency. Adjustments to revenue as a result of audit are recorded within the period they become known. To date, adjustments to revenue as a result of contracting agency audits have been insignificant .

Disaggregation of Revenue

In the following table, revenue is disaggregated by primary geographical region and source of revenue:

	Three Months ended June 30, 2018 U.S.	Three Months ended June 30, 2018 International	Total	Six Months ended June 30, 2018 U.S.	Six Months ended June 30, 2018 International	Total
	(In thousands)			(In thousands)		
Geographical region						
Asia	$ —	$ 7,673	$ 7,673	$ —	$ 15,901	$ 15,901
Canada	—	596	596	—	2,271	2,271
Europe	—	3,411	3,411	—	5,866	5,866
Latin America	—	681	681	—	1,515	1,515
U.S.	9,310	—	9,310	19,192	—	19,192
Total revenue	$ 9,310	$ 12,361	$ 21,671	$ 19,192	$ 25,553	$ 44,745
Source of revenue						
Product revenue	$ 8,754	$ 12,343	$ 21,097	$ 18,078	$ 24,696	$ 42,774
Subsea projects	—	—	—	5	839	844
Other revenue	—	18	18	—	18	18
Research services	556	—	556	1,109	—	1,109
Total revenue	$ 9,310	$ 12,361	$ 21,671	$ 19,192	$ 25,553	$ 44,745

Contract Balances

The following table presents changes in the Company's contract assets and contract liabilities during the six months ended June 30, 2018:

	Balance at December 31, 2017	Additions	Deductions	Balance at June 30, 2018
	(In thousands)			
Contract assets				
Subsea projects	$ 2,463	$ 1,148	$ (3,605)	$ 6
Research services	425	1,108	(1,184)	349
Total contract assets	$ 2,888	$ 2,256	$ (4,789)	$ 355
Contract liabilities				
Deferred revenue				
Product revenue	$ 1,178	$ 808	$ (1,237)	$ 749
Subsea projects	126	682	(126)	682
Other revenue	—	1,054	(18)	1,036
Total contract liabilities	$ 1,304	$ 2,544	$ (1,381)	$ 2,467

During the six months ended June 30, 2018, we recognized $0.2 million of revenue that was included in deferred revenue at the beginning of the period.

A contract asset is recorded when the Company satisfies a performance obligation by transferring a promised good or service and has earned the right to consideration from its customer. These assets may represent a conditional or unconditional right to consideration.

A contract liability is recorded when consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services under the terms of the contract. Contract liabilities are recognized as revenue after control of the products or services is transferred to the customer and all revenue recognition criteria have been met.

(4) Inventories

Inventories consist of the following:

	June 30, 2018	December 31, 2017
	(In thousands)	
Raw materials	$ 3,020	$ 2,543
Finished goods	9,802	6,372
Total	$ 12,822	$ 8,915

(5) Property, Plant and Equipment, Net

Property, plant and equipment consist of the following:

	June 30, 2018	December 31, 2017	Useful life
	(In thousands)		
Construction in progress	$ 8,661	$ 7,699	—
Buildings	24,016	24,013	30 years
Machinery and equipment	118,937	118,786	3-10 years
Computer equipment and software	8,218	8,099	3 years
Total	159,832	158,597	
Accumulated depreciation	(87,844)	(82,530)	
Property, plant and equipment, net	$ 71,988	$ 76,067	

Depreciation expense was $5.7 million and $5.3 million for the six months ended June 30, 2018 and 2017, respectively.

Construction in progress included engineering designs and other pre-construction costs for the planned manufacturing facility in Statesboro, Georgia of $7.2 million at both June 30, 2018 and December 31, 2017. The Company has delayed the project to construct the Statesboro, Georgia manufacturing facility to better align the timing of this capacity expansion with the Company's assessment of future demand. In addition, construction in progress included $1.0 million and less than $0.1 million at June 30, 2018 and December 31, 2017, respectively, related to projects designed to increase the capacity of the Company's East Providence, Rhode Island facility.

(6) Accrued Expenses

Accrued expenses consist of the following:

	June 30, 2018	December 31, 2017
	(In thousands)	
Employee compensation	$ 3,639	$ 4,633
Other accrued expenses	1,071	1,229
Total	$ 4,710	$ 5,862

(7) Commitments and Contingencies

Customer Supply Agreement

The Company is party to the Supply Agreement with BASF and the JDA with BASF SE. Pursuant to the Supply Agreement, the Company will sell exclusively to BASF the Company's Spaceloft A2 product at annual volumes to be specified by BASF, subject to certain volume limits. The Supply Agreement will terminate on December 31, 2027. Upon expiration of the Supply Agreement, the Company will be subject to a post-termination supply commitment for an additional two years. The JDA is designed to facilitate the collaboration between the parties on the development and commercialization of new products.

In addition, BASF, in its sole discretion, may make prepayments to the Company in the aggregate amount of up to $22.0 million during the term of the Supply Agreement. BASF agreed to make a prepayment in the amount of $5.0 million to the Company in two e qual installments in 2018 (the 2018 P repayment). The amounts and terms of additional prepayment installments, if any, are subject to negotiation between the Company and BASF.

After January 1, 2019, the Company will, at BASF's instruction, credit up to 25.3% of any amounts invoiced by the Company for Spaceloft A2 product sold to BASF against the prepayment balance. However, BASF has no obligation to purchase products under the Supply Agreement. If any of the 2018 Prepayment remains uncredited as of December 31, 2021, BASF may request that the Company repay the uncredited amount to BASF. The prepayment obligation is secured by a security interest in real estate, plant and equipment at the Company's Rhode Island facility and a license to certain intellectual property.

As of June 30, 2018, the Company had received $5.0 million of the 2018 Prepayment from BASF, which is recorded on the balance sheet as a prepayment liability, net of discount of $1.0 million. The discount will be amortized into interest expense through December 31, 2021, or until the prepayment liability is fully credited by purchases from BASF.

Prepayment liability consists of the following:

	June 30, 2018	December 31, 2017
	(In thousands)	
Prepayment liability	$ 5,000	$ —
Discount on prepayment liability	(1,054)	—
Accretion of discount expense, net	43	—
Prepayment liability, less current maturities	$ 3,989	$ —

The deferred revenue associated with the prepayment liability represents a grant to BASF of the exclusive right to sell Spaceloft A2 over the term of the Supply Agreement. Deferred revenue will be amortized into revenue on a straight-line basis over the term of the Supply Agreement. At June 30, 2018, $1.0 million was recorded as deferred revenue of which $0.1 million was recorded as a component of short term deferred revenue. During the six months ended June 30, 2018, the Company recognized less than $0.1 million in revenue associated with the grant to BASF of the exclusive right to sell Spaceloft A2 which is recorded as a component of product revenue in the consolidated statement of operations.

Deferred revenue consists of the following:

	June 30, 2018	December 31, 2017
	(In thousands)	
Total deferred revenue	$ 2,467	$ 1,304
Current maturities of deferred revenue - product revenue	(1,431)	(1,304)
Current maturities of deferred revenue - Supply Agreement	(109)	—
Deferred revenue, less current maturities	$ 927	$ —

Revolving Line of Credit

The Company entered into an Amended and Restated Loan and Security Agreement with Silicon Valley Bank (Loan Agreement), on August 31, 2014, which has been subsequently amended from time to time. On January 25, 2018, the Loan Agreement was amended to extend the maturity date of the facility to April 28, 2018. On April 25, 2018, the Loan Agreement was further amended to extend the maturity date of the facility to April 28, 2019. Under the Loan Agreement, the Company may borrow up to $20.0 million subject to compliance with certain covenants and borrowing base limitations. At the Company's election, the interest rate applicable to borrowings may be based on the prime rate or LIBOR. Prime rate-based rates vary from prime rate plus 0.75% per annum to prime rate plus 2.00% per annum, while LIBOR-based rates vary from LIBOR plus 3.75% per annum to LIBOR plus 4.25% per annum. In addition, the Company is required to pay a monthly fee of 0.5% per annum of the average unused portion of the facility. Obligations under the Loan Agreement are secured by a security interest in all assets of the Company, including those at the East Providence facility, except for certain exclusions.

At June 30, 2018 and December 31, 2017, the Company had $3.8 million drawn on the revolving credit facility. Under the Loan Agreement, the Company is required to comply with both non-financial and financial covenants, including minimum Adjusted EBITDA and minimum Adjusted Quick Ratio covenants, each as defined in the Loan Agreement. At June 30, 2018, the Company was in compliance with all such covenants.

The Company has been required to provide letters of credit to secure obligations under certain commercial contracts. The Company had outstanding letters of credit backed by the revolving credit facility of $2.0 million and $2.3 million at June 30, 2018 and December 31, 2017, respectively, which reduce the funds otherwise available to the Company under the facility.

At June 30, 2018 , the effective amount available to the Company under the revolving credit facility was $8.7 million after giving effect to the $3.8 million in outstanding borrowings and $2.0 million of outstanding letters of credit .

Litigation

The Company is, from time to time, a party to litigation that arises in the normal course of its business operations. See Part II, Item 1 ("Legal Proceedings") of this Quarterly Report on Form 10-Q for a description of certain of the Company's current legal proceedings. The Company is not presently a party to any litigation for which it believes a loss is probable requiring an amount to be accrued or a possible loss contingency requiring disclosure.

(8) Deferred Rent

The Company leases office and warehouse space in Northborough, Massachusetts and East Providence, Rhode Island.

For leases that contain fixed increases in the minimum annual lease payments during the term of the lease, the Company recognizes rental expense on a straight-line basis over the lease term, and records the difference between rent expense and the amount currently payable as deferred rent.

Deferred rent consists of the following:

	June 30, 2018	December 31, 2017
	(In thousands)	
Deferred rent	$ 1,429	$ 1,511
Current maturities of deferred rent	(194)	(208)
Deferred rent, less current maturities	$ 1,235	$ 1,303

(9) Net Loss Per Share

The computation of basic and diluted net loss per share consists of the following:

	Three Months Ended June 30, 2018	Three Months Ended June 30, 2017	Six Months Ended June 30, 2018	Six Months Ended June 30, 2017
	(In thousands, except share and per share data)			
Numerator:				
Net loss	$ (6,958)	$ (5,472)	$ (13,800)	$ (14,550)
Denominator:				
Weighted average shares outstanding, basic and diluted	23,743,358	23,369,179	23,655,676	23,313,668
Net loss per share, basic and diluted	$ (0.29)	$ (0.23)	$ (0.58)	$ (0.62)

Potentially dilutive common shares that were excluded from the computation of diluted net loss per share because they were anti-dilutive consist of the following:

	Three Months Ended June 30, 2018	Three Months Ended June 30, 2017	Six Months Ended June 30, 2018	Six Months Ended June 30, 2017
Common stock options	3,007,162	2,498,737	3,007,162	2,498,737
Restricted common stock units	949,683	950,877	949,683	950,877
Common stock warrants	—	115	—	115
Restricted common stock awards	136,187	164,148	136,187	164,148
Total	4,093,032	3,613,877	4,093,032	3,613,877

In the table above, anti-dilutive shares consist of those common stock equivalents that have (i) an exercise price above the average stock price for the period or (ii) related average unrecognized stock compensation expense sufficient to buy back the entire amount of shares. The Company excludes the shares issued in connection with restricted stock awards from the calculation of basic weighted average common shares outstanding until the restrictions lapse.

(10) Income Taxes

The Company incurred net operating losses and recorded a full valuation allowance against net deferred tax assets for all periods presented. Accordingly, the Company has not recorded a provision for federal or state income taxes.

The Securities and Exchange Commission staff issued Staff Accounting Bulletin No. 118 (SAB 118) to address the tax reform legislation enacted in the United States in 2017. In accordance with SAB 118, the Company has recognized the provisional tax impacts, related to the re-measurement of its deferred income tax assets and liabilities associated with the one-time mandatory transition tax on deemed repatriation as of December 31, 2017. Although the Company does not believe there will be any material adjustments in subsequent reporting periods, the ultimate impact may differ from the provisional amounts, due to, among other things, the significant complexity of the 2017 Tax Cuts and Jobs Act and anticipated additional regulatory guidance that may be issued by the Internal Revenue Service, changes in analysis, interpretations and assumptions the Company has made and actions the Company may take as a result of the 2017 Tax Cuts and Jobs Act.

(11) Subsequent Events

The Company has evaluated subsequent events through August 2, 2018, the date of issuance of the consolidated financial statements for the three and six months ended June 30, 2018.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following information should be read in conjunction with the unaudited financial information and the notes thereto included in this Quarterly Report on Form 10-Q and the audited financial information and the notes thereto included in the Annual Report on Form 10-K for the year ended December 31, 2017, filed with the Securities and Exchange Commission (SEC) on March 1, 2018, which we refer to as the Annual Report.

Certain matters discussed in this Quarterly Report on Form 10-Q may be deemed to be forward-looking statements that involve risks and uncertainties. We make such forward-looking statements pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and other federal securities laws. In this Quarterly Report on Form 10-Q, words such as "may," "will," "anticipate," "estimate," "expects," "projects," "intends," "plans," "believes" and similar expressions (as well as other words or expressions referencing future events, conditions or circumstances) are intended to identify forward-looking statements.

Our actual results and the timing of certain events may differ materially from the results discussed, projected, anticipated, or indicated in any forward-looking statements. We caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the industry in which we operate may differ materially from the forward-looking statements contained in this Quarterly Report on Form 10-Q. In addition, even if our results of operations, financial condition and liquidity, and the development of the industry in which we operate are consistent with the forward-looking statements contained in this Quarterly Report on Form 10-Q, they may not be predictive of results or developments in future periods.

The following information and any forward-looking statements should be considered in light of factors discussed elsewhere in this Quarterly Report on Form 10-Q and under "Risk Factors" in Item 1A of the Annual Report.

We caution readers not to place undue reliance on any forward-looking statements made by us, which speak only as of the date they are made. We disclaim any obligation, except as specifically required by law and the rules of the SEC, to publicly update or revise any such statements to reflect any change in our expectations or in events, conditions or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those set forth in the forward-looking statements.

You should read the following discussion and analysis of financial condition and results of operations together with Part I Item 1 "Financial Statements," which includes our financial statements and related notes, elsewhere in this Quarterly Report on Form 10-Q.

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, improve resource efficiency, enhance sustainability, 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 40 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. govern ment, 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 applic ations.

We manufacture our products using our proprietary technology at our facility in East Providence, Rhode Island. We have operated the East Providence facility since 2008 and have increased our annual nameplate capacity since that date to 50 million square feet of aerogel blankets. During 2018, we initiated a series of projects designed to increase this nameplate capacity to 60 million square feet of aerogel blankets by the end of 2020. We have also completed the design and engineering of a first line in a planned second manufacturing facility to be located 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 the Statesboro facility to better align the timing of this capacity expansion with our assessment of future demand. In the event that we do not commence construction of the Statesboro manufacturing facility by February 15, 2019, the governmental authorities may terminate the agreements that provide the package of incentives.

We have entered into a strategic partnership with BASF Polyurethanes GmbH (“BASF”) to develop and commercialize products for the building materials and other markets. The strategic partnership includes an amended and restated supply agreement (the “BASF Supply Agreement”) governing the sale of our Spaceloft A2 product to BASF and a joint development agreement targeting innovative products and technologies. Pursuant to the BASF Supply Agreement, BASF may, in its sole discretion, make a series of prepayments to us in the aggregate amount of up to $22.0 million in support of our capacity expansion plans, our process improvement initiatives and our new business development efforts. BASF has made prepayments to us in the aggregate amount of $5.0 million during the six months ended June 30, 2018. These 2018 prepayments will be credited against amounts invoiced to BASF for Spaceloft A2 or repaid by us to BASF on or after December 31, 2021.

Our revenue for the six months ended June 30, 2018 was $44.7 million, which represented a decrease of $3.3 million from the six months ended June 30, 2017. Net loss for the six months ended June 30, 2018 was $13.8 million and net loss per diluted share was $0.58. Net loss for the six months ended June 30, 2017 was $14.6 million and net loss per diluted share was $0.62.

Key Metrics and Non-GAAP Financial Measures

We regularly review a number of metrics, including the following key metrics, to evaluate our business, measure our performance, identify trends affecting our business, formulate financial projections and make strategic decisions.

Square Foot Operating Metric

We price our product and measure our product shipments in square feet. We estimate our annual nameplate capacity was 50 million square feet of aerogel blankets at June 30, 2018. We believe the square foot operating metric allows us and our investors to measure our manufacturing capacity and product shipments on a uniform and consistent basis. The following chart sets forth product shipments associated with recognized revenue in square feet for the periods presented:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(In thousands)			
Product shipments in square feet	7,152	8,707	14,894	16,980

Adjusted EBITDA

We use Adjusted EBITDA, a non-GAAP financial measure, as a means to assess our operating performance. We define Adjusted EBITDA as net income (loss) before interest expense, taxes, depreciation, amortization, stock-based compensation expense and other items, which occur from time to time that we do not believe are indicative of our core operating performance. Adjusted EBITDA is a supplemental measure of our performance that is not presented in accordance with U.S. GAAP. Adjusted EBITDA should not be considered as an alternative to net income (loss) or any other measure of financial performance calculated and presented in accordance with U.S. GAAP. In addition, our definition and presentation of Adjusted EBITDA may not be comparable to similarly titled measures presented by other companies.

We use Adjusted EBITDA:

- as a measure of operating performance because it does not include the impact of items that we do not consider indicative of our core operating performance;
- for planning purposes, including the preparation of our annual operating budget,
- to allocate resources to enhance the financial performance of our business; and
- as a performance measure under our bonus plan.

We also believe that the presentation of Adjusted EBITDA provides useful information to investors with respect to our results of operations and in assessing the performance and value of our business. Various measures of EBITDA are widely used by investors to measure a company's operating performance without regard to items that can vary substantially from company to company depending upon financing and accounting methods, book values of assets, capital structures and the methods by which assets were acquired.

Although measures similar to Adjusted EBITDA are frequently used by investors and securities analysts in their evaluation of companies, we understand that Adjusted EBITDA has limitations as an analytical tool, and you should not consider it in isolation or as a substitute for net income (loss), income (loss) from operations, net cash provided by (used in) operating activities or an analysis of our results of operations as reported under U.S. GAAP. Some of these limitations are:

- Adjusted EBITDA does not reflect our historical cash expenditures or future requirements for capital expenditures or other contractual commitments;
- Adjusted EBITDA does not reflect changes in, or cash requirements for, our working capital needs;
- Adjusted EBITDA does not reflect stock-based compensation expense;
- Adjusted EBITDA does not reflect our income tax expense or cash requirements to pay our income taxes;
- Adjusted EBITDA does not reflect our interest expense, or the cash requirements necessary to service interest or principal payments on our debt;
- although depreciation, amortization and impairment charges are non-cash charges, the assets being depreciated, amortized or impaired will often have to be replaced in the future, and Adjusted EBITDA does not reflect any cash requirements for these replacements; and
- other companies in our industry may calculate EBITDA or Adjusted EBITDA differently than we do, limiting their usefulness as a comparative measure.

Because of these limitations, our Adjusted EBITDA should not be considered as a measure of discretionary cash available to us to reinvest in the growth of our business or as a measure of cash available for us to meet our obligations.

To properly and prudently evaluate our business, we encourage you to review the U.S. GAAP financial statements included elsewhere in this Quarterly Report on Form 10-Q, and not to rely on any single financial measure to evaluate our business.

The following table presents a reconciliation of net loss, the most directly comparable U.S. GAAP measure, to Adjusted EBITDA for the periods presented:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(In thousands)			
Net loss	$ (6,958)	$ (5,472)	$ (13,800)	$ (14,550)
Depreciation and amortization	2,515	2,630	5,686	5,306
Stock-based compensation (1)	1,150	1,374	2,286	2,618
Interest expense	103	39	195	65
Adjusted EBITDA	$ (3,190)	$ (1,429)	$ (5,633)	$ (6,561)

(1) Represents non-cash stock-based compensation related to vesting and modifications of stock option grants, vesting of restricted stock units and vesting of restricted common stock.

Our financial performance, including such measures as net income (loss), earnings per share and Adjusted EBITDA, are affected by a number of factors including volume and mix of aerogel products sold, average selling prices, our material and manufacturing costs, the costs associated with and timing of capacity expansions and start-up of additional production capacity, and the amount and timing of operating expenses, including patent enforcement costs. As we build out manufacturing capac ity in our existing facility and in new facilities in the longer term, we expect increased manufacturing expenses will periodically have a negative impact on net income (loss), earnings per share and Adjusted EBITDA, but will set the framework for improved performance in the long term. Accordingly, we expect that our net income (loss), earnings per share and Adjusted EBITDA will vary from period to period, in particular as and when we expand our manufacturing capacity in existing or new facilities .

As a result of the conclusion of a multiyear petrochemical project with a major Asian energy company and an expected decline in the volume of subsea projects, which together comprised 19% of our product revenue during 2017, we are likely to experience a decrease in revenue during 2018. In addition, we are increasing our investment in new initiatives and personnel by approximately $6.0 million during 2018 with the objective of restoring long-term growth in our existing markets and developing new business opportunities. As a result of the likely decrease in revenue and the increase in expense associated with these new initiatives and personnel, we expect to experience an increase in net loss and net loss per share and a decrease in Adjusted EBITDA during 2018.

Emerging Growth Company Status

The JOBS Act permits us, as an "emerging growth company," to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We have opted out of this provision and, as a result, we comply with new or revised accounting standards as required when they are adopted. This decision to opt out of the extended transition period under the JOBS Act is irrevocable.

Components of Our Results of Operations

Revenue

We recognize product revenue from the sale of our line of aerogel products and research services revenue from the provision of services under contracts with various agencies of the U.S. government and other institutions. Product and research services revenue is recognized upon the satisfaction of contractual performance obligations.

We record deferred revenue for product sales when (i) we have delivered products but other revenue recognition criteria have not been satisfied or (ii) payments have been received in advance of products being delivered.

We are likely to experience a decrease in revenue during 2018 due to the conclusion of the multiyear petrochemical project with a major Asian energy company and an anticipated decrease in project related revenue in the subsea market, which together comprised 19% of our product revenue during 2017.

Cost of Revenue

Cost of product revenue consists primarily of materials and manufacturing expense. Cost of product revenue is recorded when the related product revenue is recognized.

Material is our most significant component of cost of product revenue and includes fibrous batting, silica materials and additives. Material costs as a percentage of product revenue vary from product to product due to differences in average selling prices, material requirements, product thicknesses and manufacturing yields. During the six months ended June 30, 2018, we have experienced a significant increase in the costs of silica precursor materials, which constitute over 50% of our raw material costs. In addition, we provide warranties for our products and record the estimated cost within cost of revenue in the period that the related revenue is recorded or when we become aware that a potential warranty claim is probable and can be reasonably estimated. During the six months ended June 30, 2018, a test result has indicated that tested samples performed outside the published performance specifications for a specific attribute of a product and, as a result, we have performed additional testing. We have determined that it is probable it has incurred a liability, however, the liability is not estimable as of June 30, 2018. We will continue to assess the impact of the test results on its customer base and, depending on the assessment, could be subject to material warranty charges in future periods. As a result of these factors, material costs as a percentage of revenue will vary from period to period due to changes in the mix of aerogel products sold, the costs of our raw materials or the estimated cost of warranties. However, in general, we expect material costs to decline as a percentage of revenue as we seek to achieve higher selling prices, material sourcing improvements, quality improvements and manufacturing yield enhancements for our aerogel products.

Manufacturing expense is also a significant component of cost of revenue. Manufacturing expense includes labor, utilities, maintenance expense, and depreciation on manufacturing assets. Manufacturing expense also includes stock-based compensation of manufacturing employees and shipping costs. As we increase manufacturing capacity in our East Providence, Rhode Island facility through 2020 and, over time, through the anticipated construction, operation, and expansion of a second manufacturing facility, we expect manufacturing expense as a percentage of product revenue will increase following each such expansion but will decrease in the long-term due to improved manufacturing productivity and increased product revenue supported by the additional capacity.

We expect that cost of product revenue in absolute dollars will decrease during 2018 compared to 2017. The projected decrease in cost of product revenue in absolute dollars reflects the impact of a planned decrease in manufacturing output and an expected favorable mix of products sold, offset, in part, by an increase in the cost of our raw materials, and an expected increase in personnel and expense in support of our capacity expansion and growth initiatives. We expect the cost of product revenue as a percentage of product revenue will increase during 2018.

Cost of research services revenue consists of direct labor costs of research personnel engaged in the contract research, third-party consulting expense, and associated direct material costs. This cost of revenue also includes overhead expenses associated with project resources, development tools and supplies. Cost of research services revenue is recorded when the related research services revenue is recognized.

Gross Profit

Our gross profit as a percentage of revenue is affected by a number of factors, including the volume of aerogel products produced and sold, the mix of aerogel products sold, average selling prices, our material and manufacturing costs, realized capacity utilization and the costs associated with expansions and start-up of production capacity. Accordingly, we expect our gross profit in absolute dollars and as a percentage of revenue to vary significantly from period to period. As and when we build out our manufacturing capacity, we expect increased manufacturing expenses will periodically have a negative impact on gross profit in the periods following any such expansion.

Due to the conclusion of a multiyear petrochemical project with a major Asian energy company and an expected decrease in the volume of subsea projects, which together comprised 19% of our product revenue during 2017, we are likely to experience a decrease in revenue and an associated decrease in gross profit in absolute dollars and as a percentage of revenue during 2018. During the six months ended June 30, 2018, we have also experienced a significant increase in the costs of silica materials, which constitute over 50% or our raw material costs. In addition, we are increasing investment in manufacturing personnel and expenses during 2018 in support of our objective to increase the capacity of our East Providence manufacturing facility, operational improvement initiatives and our new business development efforts. As a result of these factors, we expect to experience a decrease in gross profit during 2018.

However, in the longer term, we expect gross profit to improve in absolute dollars and as a percentage of revenue due to expected increases in total revenue, productions volumes and manufacturing productivity. In turn, the increases in revenue, volume and productivity are expected to be supported by planned capacity expansions, improvements in manufacturing yields and the realization of material purchasing efficiencies.

Operating Expenses

Operating expenses consist of research and development, sales and marketing, and general and administrative expenses. Operating expenses include personnel costs, legal fees, professional fees, service fees, insurance premiums, travel expense, facilities related costs and other costs and fees. The largest component of our operating expenses is personnel costs, consisting of salaries, benefits, incentive compensation and stock-based compensation. In any particular period, the timing and extent of personnel additions or reductions, legal activities, including patent enforcement actions, marketing programs, research efforts and a range of similar activities or actions could materially affect our operating expenses, both in absolute dollars and as a percentage of revenue.

We are increasing our investment in new initiatives and personnel during 2018 with the objective of restoring long-term growth in our existing markets and to develop new business opportunities. As a result of the increase in operating expenses for new initiatives and personnel, we may experience an increase in operating expenses in absolute dollars and expect to experience an increase in operating expenses as a percentage of revenue during 2018.

Research and Development Expenses

Research and development expenses consist primarily of expenses for personnel engaged in the development of next generation aerogel compositions, form factors and manufacturing technologies. These expenses also include testing services, prototype expenses, consulting services, equipment depreciation, facilities costs and related overhead. We expense research and development costs as incurred. We expect to continue to devote substantial resources to the development of new aerogel technologies. We believe that these investments are necessary to maintain and improve our competitive position. We expect to continue to invest in research and engineering personnel and the infrastructure required in support of their efforts. While we expect that our research and development expe nses will increase in absolute dollars but decrease as a percentage of revenue in the longer term, in the nearer term we expect such expenses will increase as a percentage of revenue.

Sales and Marketing Expenses

Sales and marketing expenses consist primarily of personnel costs, incentive compensation, marketing programs, travel and related costs, consulting expenses and facilities related costs. We are expanding our sales force and sales consultants globally to drive anticipated growth in customers and demand for our products. While we expect that sales and marketing expenses will increase in absolute dollars but decrease as a percentage of revenue in the longer-term, in the nearer term we expect such expenses will increase as a percentage of revenue.

General and Administrative Expenses

General and administrative expenses consist primarily of personnel costs, legal expenses, consulting and professional services, audit and tax consulting costs, and expenses for our executive, finance, legal, human resources and information technology organizations. General and administrative expenses have increased as we have incurred additional costs related to operating as a publicly-traded company, which include costs of compliance with securities, corporate governance and related laws and regulations, investor relations expenses, increased insurance premiums, including director and officer insurance, and increased audit and legal fees. In addition, we expect our general and administrative expenses to increase as we add general and administrative personnel to support the anticipated growth of our business and continued expansion of our manufacturing operations. We also expect that the patent enforcement actions, described in more detail under "Legal Proceedings" in Part II, Item 1 of this Quarterly Report on Form 10-Q, if protracted, could result in significant additional legal expense over the medium to long-term. During 2018, we expect general and administrative expense will decrease both in absolute dollars and as a percentage of revenue due to an anticipated reduction in patent enforcement costs. In the longer term, however, we expect that general and administrative expenses will increase in absolute dollars but continue to decline as a percentage of revenue.

Interest Expense, Net

For the six months ended June 30, 2018, interest expense, net consisted of fees and interest expense related to our revolving credit facility and less than $0.1 million of accretion of the prepayment liability discount associated with the BASF Supply Agreement. For the six months ended June 30, 2017, interest expense, net consisted primarily of fees related to our revolving credit facility.

Provision for Income Taxes

We have incurred net losses since inception and have not recorded benefit provisions for U.S. federal income taxes or state income taxes since the tax benefits of our net losses have been offset by valuation allowances due to the uncertainty associated with the utilization of net operating loss carryforwards.

Results of Operations

Three months ended June 30, 2018 compared to the three months ended June 30, 2017

The following tables set forth a comparison of the components of our results of operations for the periods presented:

Revenue

	Three Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
			($ in thousands)			
Revenue:						
Product	$ 21,115	97%	$ 24,562	98%	$ (3,447)	(14)%
Research services	556	3%	507	2%	49	10%
Total revenue	$ 21,671	100%	$ 25,069	100%	$ (3,398)	(14)%

The following chart sets forth product shipments in square feet for the periods presented:

	Three Months Ended June 30,		Change	
	2018	2017	Amount	Percentage
Product shipments in square feet (in thousands)	7,152	8,707	(1,555)	(18)%

Total revenue decreased $3.4 million, or 14%, to $21.7 million for the three months ended June 30, 2018 from $25.1 million in the comparable period in 2017 primarily as a result of a decrease in product revenue.

Product revenue decreased by $3.5 million, or 14%, to $21.1 million for the three months ended June 30, 2018 from $24.6 million in the comparable period in 2017. This decrease was the principally the result of a decline in project work in the subsea market and due to the successful conclusion of several LNG projects during 2017, offset, in part, by growth in the petrochemical and refinery markets, particularly in North America.

Product revenue for the three months ended June 30, 2018 included $3.9 million and $3.0 million to two North American distributors, respectively, and $2.3 million to an Asian distributor. Product revenue for the three months ended June 30, 2017 included $3.3 million in sales to a North American distributor, and $2.7 million and $2.4 million in sales to two Asian distributors, respectively.

The average selling price per square foot of our products increased by $0.13, or 5%, to $2.95 per square foot for the three months ended June 30, 2018 from $2.82 per square foot for the three months ended June 30, 2017. The increase in average selling price reflected the impact of price increases enacted in early 2018 and a favorable mix of products sold. This increase in average selling price had the effect of increasing product revenue by $1.0 million for the three months ended June 30, 2018 from the comparable period in 2017.

In volume terms, product shipments decreased by 1.6 million square feet, or 18%, to 7.2 million square feet of aerogel products for the three months ended June 30, 2018, as compared to 8.7 million square feet for the three months ended June 30, 2017. The decrease in product volume had the effect of decreasing product revenue by $4.4 million for the three months ended June 30, 2018 from the comparable period in 2017.

Research services revenue increased $0.1 million, or 10%, to $0.6 million for the three months ended June 30, 2018 from $0.5 million in the comparable period in 2017. The increase was primarily due to the timing and amount of funding available under existing research contracts during the three months ended June 30, 2018 versus the comparable period in 2017.

Product revenue was 97% of total revenue for the three months ended June 30, 2018 and 98% for the three months June 30, 2017. Research services revenue was 3% of total revenue for the three months ended June 30, 2018 and 2% of total revenue for the three months ended June 30, 2017.

We are likely to experience a decrease in revenue during 2018 due to the conclusion of the multiyear petrochemical project with a major Asian energy company and an anticipated decrease in project related revenue in the subsea market.

Cost of Revenue

	Three Months Ended June 30,							
	2018			2017			Change	
	Amount	Percentage of Related Revenue	Percentage of Total Revenue	Amount	Percentage of Related Revenue	Percentage of Total Revenue	Amount	Percentage
	($ in thousands)							
Cost of revenue:								
Product	$ 18,676	88%	86%	$ 21,121	86%	84%	$ (2,445)	(12)%
Research services	251	45%	1%	254	50%	1%	(3)	(1)%
Total cost of revenue	$ 18,927	87%	87%	$ 21,375	85%	85%	$ (2,448)	(11)%

Total cost of revenue decreased $2.5 million, or 11%, to $18.9 million for the three months ended June 30, 2018 from $21.4 million in the comparable period in 2017. The decrease in total cost of revenue was primarily the result of a decrease in product cost of revenue.

Product cost of revenue decreased $2.4 million, or 12%, to $18.7 million for the three months ended June 30, 2018 from $21.1 million in the comparable period in 2017. The $2.4 million decrease was the result of a $2.3 million decrease in material costs and a $0.1 million de crease in manufac turing expense . The decrease in material costs was driven by the 1.6 million square foot, or 18%, decrease in product shipments period over period , offset, in part, by an increas e in the cost of silica materials, which constitute over 50% or our raw material costs. The decrease in manufacturing expense was t he result of decreases in utilities of $0.3 million and maintenance expense of $0.2 million, offset, in part, an in crease in compensation and related costs of $0.4 million .

Product cost of revenue as a percentage of product revenue increased to 88% during the three months ended June 30, 2018 from 86% during the three months ended June 30, 2017. This increase was the result of the high proportion of fixed manufacturing expenses that remained essentially unchanged despite a 12% decrease in product revenue for the three months ended June 30, 2018 from the comparable period in 2017. We expect that cost of product revenue will decrease in absolute dollars, but will increase as a percentage of product revenue during 2018 versus 2017.

Research services cost of revenue was $0.3 million for the three months ended June 30, 2018, and 2017. Cost of research service revenue as a percentage of research services revenue decreased to 45% during the three months ended June 30, 2018 from 50% in the comparable period in 2017 due to a reduction in outside services utilized to support the contracted research.

Gross Profit

	Three Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Gross profit	$ 2,744	13%	$ 3,694	15%	$ (950)	(26)%

Gross profit decreased less than $1.0 million, or 26%, to $2.7 million for the three months ended June 30, 2018 from $3.7 million in the comparable period in 2017. The decrease in gross profit was the result of the $3.4 million decrease in total revenue, offset, in part, by the $2.5 million decrease in total cost of revenue. The decrease in revenue was principally associated with the decline in project work in the subsea market and due to the successful conclusion of several LNG projects during 2017. The decrease in total cost of revenue was driven by the 1.6 million square foot, or 18%, decrease in product shipments period over period, offset, in part, by an increase in the cost of silica materials, which constitute over 50% or our raw material costs.

Gross profit as a percentage of total revenue decreased to 13% of total revenue for the three months ended June 30, 2018 from 15% in the comparable period in 2017. We expect gross profit in absolute dollars and as a percentage of revenue will decline during the second half of 2018 from the comparable period in 2017.

Research and Development Expenses

	Three Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Research and development expenses	$ 1,638	8%	$ 1,709	7%	$ (71)	(4)%

Research and development expenses decreased by $0.1 million, or 4%, to $1.6 million for the three months ended June 30, 2018 from $1.7 million in the comparable period in 2017. The decrease was primarily the result of a decrease in professional fees.

Research and development expenses as a percentage of total revenue increased to 8% for the three months ended June 30, 2018 as compared to 7% in the comparable period in 2017 due principally to the decrease in revenue during the three months ended June 30, 2018.

We expect that our research and development expenses during 2018 will increase from 2017 levels in support of investments in innovative products, advanced process technologies, and new markets. Due principally to the expected growth in research and development expenses, we expect research and development expenses as a percentage of total revenue to increase in 2018.

Sales and Marketing Expenses

	Three Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Sales and marketing expenses	$ 3,721	17%	$ 3,416	14%	$ 305	9%

Sales and marketing expenses increased by $0.3 million, or 9%, to $3.7 million for the three months ended June 30, 2018 from $3.4 million in the comparable period in 2017. The $0.3 million increase was the result of an increase in professional fees of $0.3 million and travel expense of $0.2 million, offset, in part, by a decrease in compensation and related costs of $0.2 million.

Sales and marketing expenses as a percentage of total revenue increased to 17% for the three months ended June 30, 2018 from 14% in the comparable period in 2017 due to the combination of the increase in sales and marketing expenses and the decrease in revenue during the three months ended June 30, 2018.

We expect sales and marketing expenses to increase during 2018 in line with a planned increase in sales personnel and marketing initiatives. Due principally to the expected growth in sales and marketing expenses, we expect sales and marketing expenses as a percentage of total revenue to increase in 2018.

General and Administrative Expenses

	Three Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
General and administrative expenses	$ 4,240	20%	$ 4,002	16%	$ 238	6%

General and administrative expenses increased by $0.2 million, or 6%, to $4.2 million during the three months ended June 30, 2018 from $4.0 million in the comparable period in 2017. The $0.2 million increase was the result of an increases in compensation and related costs of $0.1 million and other general and administrative expenses of $0.1 million.

General and administrative expenses as a percentage of total revenue increased to 20% for the three months ended June 30, 2018 from 16% in the comparable period in 2017. This increase was due primarily to the decrease in revenue during the three months ended June 30, 2018 from the comparable period in 2017.

We expect general and administrative expenses to decrease during 2018 due principally to expected decreases in patent enforcement costs. Due to the projected decrease in general and administrative expenses, we expect general and administrative expenses as a percentage of total revenue to decrease in 2018 .

Interest Expense, net

	Three Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Interest expense, net	$ (103)	(0)%	$ (39)	(0)%	$ (64)	164%

Interest expense, net increased to $0.1 million during three months ended June 30, 2018 from less than $0.1 million during the comparable period in 2017. The $0.1 million increase was primarily due to an increase in interest expense associated with outstanding balances under our revolving line of credit and accretion of the prepayment liability discount associated with the BASF Supply Agreement.

Six months ended June 30, 2018 compared to the six months ended June 30, 2017

The following tables set forth a comparison of the components of our results of operations for the periods presented:

Revenue

	Six Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Revenue:						
Product	$ 43,636	98%	$ 46,888	98%	$ (3,252)	(7)%
Research services	1,109	2%	1,183	2%	(74)	(6)%
Total Revenue	$ 44,745	100%	$ 48,071	100%	$ (3,326)	(7)%

The following chart sets forth product shipments in square feet for the periods presented:

	Six Months Ended June 30,		Change	
	2018	2017	Amount	Percentage
Product shipments in square feet (in thousands)	14,894	16,980	(2,086)	(12)%

Total revenue decreased $3.3 million, or 7%, to $44.7 million for the six months ended June 30, 2018 from $48.1 million in the comparable period in 2017 primarily as a result of a decrease in product revenue.

Product revenue decreased by $3.3 million, or 7%, to $43.6 million for the six months ended June 30, 2018 from $46.9 million in the comparable period in 2017. This decrease was principally the result of a decline in project work in the subsea market and due to the successful conclusion of the multiyear petrochemical project with a major Asian energy company and several LNG projects during 2017, offset, in part, by growth in the petrochemical and refinery markets, particularly in North America.

Product revenue for the six months ended June 30, 2018 included $10.6 million to a North American distributor and $6.3 million to an Asian distributor. Product revenue for the six months ended June 30, 2017 included $7.0 million in sales to a North American distributor and $5.8 million to an Asian distributor.

The average selling price per square foot of our products increased by $0.17, or 6%, to $2.93 per square foot for the six months ended June 30, 2018 from $2.76 per square foot for the six months ended June 30, 2017 . The increase in average selling price reflected the impact of price increases enacted in early 2018 and a favorable mix of products sold. This increase in average selling price had the effect of increasing product revenue by $2.5 million for the six months ended June 30, 2018 from the comparable period in 2017.

In volume terms, product shipments decreased by 2.1 million square feet, or 12%, to 14.9 million square feet of aerogel products for the six months ended June 30, 2018, as compared to 17.0 million square feet for the six months ended June 30, 2017 . The decrease in product volume had the effect of decreasing product revenue by $5.8 million for the six months ended June 30, 2018 from the comparable period in 2017.

Research services revenue decreased $0.1 million, or 6%, to $1.1 million for the six months ended June 30, 2018 from $1.2 million in the comparable period in 2017. The decrease was primarily due to the timing and amount of funding available under existing research contracts during the six months ended June 30, 2018 from the comparable period in 2017.

Product revenue was 98% of total revenue for the six months ended June 30, 2018 and 2017. Research services revenue was 2% of total revenue for the six months ended June 30, 2018 and 2017.

Cost of Revenue

	Six Months Ended June 30,						Change	
	2018			2017				
	Amount	Percentage of Related Revenue	Percentage of Total Revenue	Amount	Percentage of Related Revenue	Percentage of Total Revenue	Amount	Percentage
	($ in thousands)							
Cost of revenue:								
Product	$ 38,699	89%	86%	$ 41,591	89%	87%	$ (2,892)	(7)%
Research services	492	44%	1%	565	48%	1%	(73)	(13)%
Total cost of revenue	$ 39,191	88%	88%	$ 42,156	88%	88%	$ (2,965)	(7)%

Total cost of revenue decreased $3.0 million, or 7%, to $39.2 million for the six months ended June 30, 2018 from $42.2 million in the comparable period in 2017. The decrease in total cost of revenue was primarily the result of a decrease in product cost of revenue.

Product cost of revenue decreased $2.9 million, or 7%, to $38.7 million for the six months ended June 30, 2018 from $41.6 million in the comparable period in 2017. The $2.9 million decrease was the result of a $3.2 million decrease in material costs, offset by a $0.3 million increase in manufacturing expense. The decrease in material costs was driven by the 2.1 million square feet, or 12%, decrease in product shipments period over period and a decrease in warranty expense, offset, in part, by an increase in the cost of silica materials, which constitute over 50% of our raw material costs. The increase in manufacturing expense was the result of increases in compensation and related costs of $0.7 million and depreciation expense of $0.4 million, offset, in part, by decreases in maintenance expense of $0.5 million and utilities expense of $0.3 million.

Product cost of revenue as a percentage of product revenue remained at 89% during the six months ended June 30, 2018 and 2017.

Research services cost of revenue decreased $0.1 million, or 13% to $0.5 million for the six months ended June 30, 2018 from $0.6 million in the comparable period in 2017. Cost of research service revenue as a percentage of research services revenue decreased to 44% during the six months ended June 30, 2018 from 48% in the comparable period in 2017 due to a reduction in outside services utilized to support the contracted research.

Gross Profit

	Six Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Gross profit	$ 5,554	12%	$ 5,915	12%	$ (361)	(6)%

Gross profit decreased $0.3 million, or 6%, to $5.6 million for the six months ended June 30, 2018 from $5.9 million in the comparable period in 2017. The decrease in gross profit was the result of the $3.3 million decrease in total revenue, offset, in part, by the $3.0 million decrease in total cost of revenue. The decrease in total revenue was principally associated with the decline in project work in the subsea market and from the successful conclusion of the multiyear petrochemical project with a major Asian energy company and several LNG projects in 2017. The decrease in total cost of revenue was driven by the 2.1 million square feet, or 12%, decrease in product shipments period over period and a decrease in warranty expense, offset, in part, by an increase in the cost of silica materials, which constitute over 50% of our raw material costs.

Gross profit as a percentage of total revenue remained 12% of total revenue for the six months ended June 30, 2018 and 2017.

Research and Development Expenses

	Six Months Ended June 30,				Change	
	2018		2017			
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Research and development expenses	$ 3,243	7%	$ 3,285	7%	$ (42)	(1)%

Research and development expenses decreased by less than $0.1 million, or 1%, to $3.2 million for the six months ended June 30, 2018 from $3.3 million in the comparable period in 2017. Increases in compensation and related costs of $0.1 million were partially offset by professional fees and other expenses . Research and development expenses as a percentage of t otal revenue remained 7% for the six months ended June 30, 2018 and 2017.

Sales and Marketing Expenses

	Six Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Sales and marketing expenses	$ 7,220	16%	$ 6,526	14%	$ 694	11%

Sales and marketing expenses increased by $0.7 million, or 11%, to $7.2 million for the six months ended June 30, 2018 from $6.5 million in the comparable period in 2017. The $0.7 million was the result of increases in travel and related costs of $0.3 million, other sales and marketing expense of $0.3 million and compensation and related costs of $0.1 million.

Sales and marketing expenses as a percentage of total revenue increased to 16% for the six months ended June 30, 2018 from 14% in the comparable period in 2017 due to the combination of the increase in sales and marketing expenses and the decrease in revenue during the six months ended June 30, 2018.

General and Administrative Expenses

	Six Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
General and administrative expenses	$ 8,696	19%	$ 10,589	22%	$ (1,893)	(18)%

General and administrative expenses decreased by $1.9 million, or 18%, to $8.7 million during the six months ended June 30, 2018 from $10.6 million in the comparable period in 2017. The $1.9 million decrease was primarily the result of a decrease in patent enforcement costs of $2.6 million, offset, in part, by increases in compensation and related costs of $0.2 million, legal and professional fees of $0.2 million, and other administrative expenses of $0.3 million.

General and administrative expenses as a percentage of total revenue decreased to 19% for the six months ended June 30, 2018 from 22% in the comparable period in 2017. This decrease was due primarily to the decrease in patent enforcement costs during the six months ended June 30, 2018 from the comparable period in 2017.

Interest Expense, net

	Six Months Ended June 30,					
	2018		2017		Change	
	Amount	Percentage of Revenue	Amount	Percentage of Revenue	Amount	Percentage
	($ in thousands)					
Interest expense, net	$ (195)	(0)%	$ (65)	(0)%	$ (130)	(200)%

Interest expense, net increased by $0.1 million, or 200%, to $0.2 million during the six months ended June 30, 2018 from less than $0.1 million during the comparable period in 2017. The $0.1 million increase was the result of an increase in interest expense associated with outstanding balances under our revolving line of credit and accretion of the prepayment liability discount associated with the BASF Supply Agreement.

Liquidity and Capital Resources

Overview

We have experienced significant losses and invested substantial resources since our inception to develop, commercialize and protect our aerogel technology and to build a manufacturing infrastructure capable of supplying aerogel products at the volumes and costs required by our customers. These investments have included research and development and other operating expenses, capital expenditures and investment in working capital balances.

Through 2015, we experienced revenue growth and gained share in our target markets. Despite a decline in revenue in 2016 and 2017 and a likely decline in revenue in 2018, our financial projections anticipate long-term revenue growth, with increasing levels of gross profit and improved cash flows from operations. To support this growth, we expect to incur up to $20.0 million of capital expenditures related to our plan to increase the capacity of our East Providence, Rhode Island manufa cturing facil ity by 20% by the end of 2020. In addition we expect to incur up to $130 million of capital expenditures to construct a first manufacturing line in a planned second manufacturing facility to be located in Statesboro, Georgia which, while curre ntly delayed, we believe will ultimately be needed to support this expected long term growth in demand.

We believe that our existing cash balance and anticipated credit will be sufficient to fund a portion of the planned expansion of our East Providence manufacturing facility. As of June 30, 2018, we have received $5.0 million of prepayments pursuant to the BASF Supply Agreement in support of our capacity expansion plans, our process improvement initiatives and our new business development efforts. In addition, we plan to manage other capital expenditures and working capital balances to maintain the cash resources required to support current operating requirements and the initial phases of our capacity expansion plan.

Beyond 2018, we will need to supplement our cash balance with anticipated cash flows from operations, local government grants, debt financings, customer prepayments, technology licensing agreements and equity financings, if necessary, to provide the capital required to complete the expansion of our existing manufacturing facility and the first production line in our second manufacturing facility .

Primary Sources of Liquidity

Our principal sources of liquidity are currently our cash and cash equivalents and our revolving credit facility with Silicon Valley Bank. Cash and cash equivalents consist primarily of cash and money market accounts on deposit with banks. As of June 30, 2018, we had $7.3 million of cash and cash equivalents.

At June 30, 2018, we had debt obligations of $3.8 million related to borrowings under our revolving credit facility with Silicon Valley Bank, $2.0 million of outstanding letters of credit secured by the revolving credit facility and an obligation of $5.0 million associated with prepayments received pursuant to the BASF Supply Agreement.

We have maintained the revolving credit facility with Silicon Valley Bank since March 2011, which has been amended from time to time. Under our revolving credit facility, we are permitted to borrow a maximum of $20.0 million, subject to continued covenant compliance and borrowing base requirements. At our election, the interest rate applicable to borrowings under the revolving credit facility may be based on the prime rate or LIBOR. Prime rate-based rates vary from prime rate plus 0.75% per annum to prime rate plus 2.00% per annum, while LIBOR-based rates vary from LIBOR plus 3.75% per annum to LIBOR plus 4.25% per annum. In addition, we are required to pay a monthly unused revolving line facility fee of 0.5% per annum of the average unused portion of the revolving credit facility. The revolving credit facility matures on April 28, 2019.

The effective amount available to us under the facility at June 30, 2018 was $8.7 million after giving effect to $3.8 million of borrowings and $2.0 million of letters of credit outstanding.

Analysis of Cash Flow

Net Cash Used in Operating Activities

During the six months ended June 30, 2018, we used $6.2 million in net cash in operating activities, as compared to the use of $6.0 million in net cash during the comparable period in 2017, an increase in the use of cash of $0.2 million. This increase in use of cash was the result of the increase in cash used by changes in operating assets and liabilities of $1.1 million, offset, in part, by a decrease in cash used for net loss adjusted for non-cash items of $0.9 million.

Net Cash Used in Investing Activities

Net cash used in investing activities is primarily related to capital expenditures to support our growth. Net cash used in investing activities for the six months ended June 30, 2018 and 2017 was $1.7 million and $4.8 million, respectively, in capital expenditures primarily for machinery and equipment to improve the throughput and efficiency of our East Providence facility.

Net Cash Used in Financing Activities

Net cash provided by financing activities for the six months ended June 30, 2018 totaled $4.5 million and consisted of $5.0 million in prepayment proceeds under the BASF Supply Agreement, offset, in part, by $0.5 million in cash used for payments made for employee tax withholdings associated with the vesting of restricted stock units. In addition, we borrowed and repaid $12.1 million in advances under our line of credit.

Net cash used in financing activities for the six months ended June 30, 2017 totaled $0.3 million and consisted of $0.3 million for payments made for employee tax withholdings associated with the vesting of restricted stock units and less than $0.1 million for repayments of obligations under capital leases.

Off Balance Sheet Arrangements

Since inception, we have not engaged in any off balance sheet activities as defined in Item 303(a)(4) of Regulation S-K.

Contractual Obligations and Commitments

There have been no material changes to our contractual obligations and commitments as reported in our Annual Report.

Recent Accounting Pronouncements

Information regarding new accounting pronouncements is included in note 2 to our unaudited consolidated financial statements contained in Item 1 of this Quarterly Report on Form 10-Q.

Critical Accounting Policies and Estimates

Our financial statements are prepared in accordance with U.S. GAAP. The preparation of our financial statements and related disclosures requires us to make estimates, assumptions and judgments that affect the reported amount of assets, liabilities, revenue, costs and expenses and related disclosures. We believe that the estimates, assumptions and judgments involved in these accounting policies have the greatest potential impact on our financial statements and, therefore, we consider these to be our critical accounting policies. Accordingly, we evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions and conditions. See our Annual Report and note 2 to our consolidated financial statements included elsewhere in this Quarterly Report on Form 10-Q for information about these critical accounting policies, as well as a description of our other significant accounting policies.

Certain Factors That May Affect Future Results of Operations

The SEC, encourages companies to disclose forward-looking information so that investors can better understand a company's future prospects and make informed investment decisions. This Quarterly Report on Form 10-Q contains such "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These statements involve known and unknown risks, uncertainties and other important factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to, 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; the performance of our aerogel blankets; our plans to construct a second manufacturing facility in Statesboro, Georgia; our plans to expand capacity in our East Providence, Rhode Island manufacturing facility; our estimates of annual production capacity; 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; the BASF Supply Agreement, our supply to BASF of its Spaceloft A2 product, the potential for future cash advances from BASF under the BASF 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 capacity expansion in our East Providence, Rhode Island manufacturing facility and 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 potential litigation or their respective timing, including expected legal expense in connection with our 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.

Words such as “may,” “will,” “anticipate,” “estimate,” “expects,” “projects,” “intends,” “plans,” “believes” and words and terms of similar substance used in connection with any discussion of future operating or financial performance , identify forward-looking statements. All forward-looking statements are management’s present expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from thos e described in the forward-looking statements. These risks include, but are not limited to, those set forth in this Quarterly Report on Form 10-Q and under the heading “Risk Factors” contained in Item 1A of our Annual Report.

In light of these assumptions, risks and uncertainties, the results and events discussed in the forward-looking statements contained in this Quarterly Report on Form 10-Q might not occur. Stockholders and other readers are cautioned not to place undue reliance on the forward-looking statements, which speak only as of the date of this Quarterly Report on Form 10-Q. We are not under any obligation, and we expressly disclaim any obligation, to update or alter any forward-looking statements, whether as a result of new information, future events or otherwise. All subsequent forward-looking statements attributable to Aspen Aerogels, Inc. or to any person acting on its behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

Market risk represents the risk of loss that may impact our financial position due to adverse changes in financial market prices and rates. Our market risk exposure results primarily from fluctuations in interest rates as well as from inflation. In the normal course of business, we are exposed to market risks, including changes in interest rates which affect our line of credit under our revolving credit facility as well as cash flows. We may also face additional exchange rate risk in the future as we expand our business internationally.

Interest Rate Risk

We are exposed to changes in interest rates in the normal course of our business. At June 30, 2018, we had unrestricted cash and cash equivalents of $7.3 million. These amounts were held for working capital and capital expansion purposes and were invested primarily in deposit and money market accounts at a major financial institution in North America. Due to the short-term nature of these investments, we believe that our exposure to changes in the fair value of our cash as a result of changes in interest rates is not material.

As of June 30, 2018, we had $3.8 million drawn and outstanding on our revolving credit facility. At June 30, 2018, we also had $2.0 million of outstanding letters of credit supported by the revolving credit facility.

Under our revolving credit facility, we are permitted to borrow a maximum of $20.0 million, subject to continued covenant compliance and borrowing base requirements. At our election, the interest rate applicable to borrowings under the revolving credit facility may be based on the prime rate or LIBOR. Prime rate-based rates vary from prime rate plus 0.75% per annum to prime rate plus 2.00% per annum, while LIBOR-based rates vary from LIBOR plus 3.75% per annum to LIBOR plus 4.25% per annum. In addition, we are required to pay a monthly unused revolving line facility fee of 0.5% per annum of the average unused portion of the revolving credit facility. On January 25, 2018, the Loan Agreement was amended to extend the maturity date of the facility to April 28, 2018. On April 25, 2018, the Loan Agreement was further amended to extend the maturity date of the facility to April 28, 2019.

At June 30, 2018, the amount available to us under the revolving credit facility was $8.7 million after giving effect to the $3.8 million in borrowings and $2.0 million of letters of credit outstanding under the facility.

Inflation Risk

Although we expect that our operating results will be influenced by general economic conditions, we do not believe that inflation has had a material effect on our results of operations during the periods presented in this report. However, our business may be affected by inflation in the future.

Foreign Currency Exchange Risk

We are subject to inherent risks attributed to operating in a global economy. Principally all of our revenue, receivables, purchases and debts are denominated in U.S. dollars.

Item 4. Controls and Procedures.

(a) *Evaluation of Disclosure Controls and Procedures* .

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Securities and Exchange Act of 1934, as amended (the " E xchange Act ") , is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and is accumulated and communicated to our management, including our principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

As of June 30, 2018, our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on such evaluation, our principal executive officer and principal financial officer have concluded that, as of June 30, 2018, our disclosure controls and procedures were effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and is accumulated and communicated to our management, including our principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

(b) *Changes in Internal Controls* .

During the six months ended June 30, 2018, there were no changes in our internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15(d)-15(f) promulgated under the Exchange Act, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II — OTHE R INFORMATION

Item 1. Legal Proceedings.

In May 2016, we filed a complaint for patent infringement against Nano Tech Co., Ltd. (“Nano”) and Guangdong Alison Hi Tech., Ltd. (“Alison” and together with Nano, the “Respondents”) in the International Trade Commission (“ITC”). The ITC complaint alleged that these two China-based companies engaged in unfair trade practices by importing aerogel products in the United States that infringed, and/or are manufactured by processes that infringe, several of our patents in violation of Section 337 of the Tariff Act. In the ITC complaint, we sought exclusion orders from the ITC that direct the United States Customs and Border Protection to stop the importation of these infringing products. In June 2016, the ITC instituted an investigation based on our complaint. In September 2017, the Administrative Law Judge (“ALJ”) presiding over the ITC investigation issued an Initial Determination finding that Alison and Nano infringed our patents relating to aerogel insulation and/or the methods of manufacturing aerogel insulation. As part of the Initial Determination, the ALJ found that Alison and Nano infringed all the patent claims asserted against each of them across the three asserted patents and that Alison and Nano failed to prove that the asserted claims were invalid. The ALJ also recommended a limited exclusion order as a remedy to prevent the importation of infringing aerogel products into the United States. In February 2018, the ITC issued its final determination confirming the ALJ’s infringement and validity determinations except with respect to one dependent product claim where the ITC found the claim not infringed. The ITC also revised some of the ALJ’s claim constructions. However, the ITC affirmed that Alison and Nano each violated Section 337 of the Tariff Act and issued a limited exclusion order prohibiting importation of infringing aerogel insulation products manufactured by Alison and Nano. The exclusion order, which is enforced by the United States Customs and Border Protection, is currently in effect. In June 2018, Alison has filed a notice of appeal seeking a review of the ITC determination and order by the United States Court of Appeals for the Federal Circuit. In the ensuing appeal with the ITC as the appellee, our motion to intervene has been granted. In addition to Respondents’ contention at the ITC that the asserted patents were invalid, Alison also filed petitions with the United States Patent and Trademark Office (“USPTO”) requesting Inter-Partes Review to cancel certain claims in three of our manufacturing process patents and one product patent. A three-member panel of Administrative Patent Judges at the USPTO denied all of Alison’s petitions to institute Inter-Partes Review challenging the validity of these Aspen patents. Alison also filed similar requests with the Chinese Patent Office (“SIPO”) seeking to invalidate two of our Chinese manufacturing process patents and two of our Chinese product patents. After the conclusion of the oral proceedings and before any decision issued by the SIPO, Alison withdrew all of its requests for invalidation of our Chinese patents. In May 2018, Alison filed another request seeking invalidation of one of our manufacturing process patents at SIPO, the same patent that it previously sought to invalidate and subsequently withdrew the request in 2017. The proceeding is ongoing.

In April 2016, we also filed a patent infringement suit at the District Court in Mannheim, Germany against the Respondents and two European resellers asserting their infringement of one of our German patents. We subsequently asserted infringement of another three patents against Nano and a European reseller of Alison’s products at the Mannheim court. We have since settled with one European reseller in exchange for a commitment not to procure infringing products and cooperation with our case. In January 2018, the court issued a series of judgments by acknowledgement (German, “Anerkenntnisurteil”) finding the second reseller, Hiltex, liable for infringement and also issued injunctions against Hiltex. The judgments resulted from a settlement agreement in which Hiltex agreed not to resell the infringing products in Europe where at least one of the asserted patents are active. Nano and Alison also initiated a nullity actions in German Federal Patent Court against our asserted German patents. They likewise filed an opposition to one of the asserted patents at the European Patent Office (“EPO”). The infringement litigation against Alison and Nano remains ongoing with respect to the earlier asserted patent while the Mannheim court stayed the proceedings involving subsequently asserted patents pending resolution of the nullity actions and the EPO opposition.

Due to their nature, it is difficult to predict the outcome or the costs involved in any litigation or administrative proceedings, including any appeals process. Furthermore, the Respondents may have significant resources and interest to litigate and therefore, these litigation matters could be protracted and may ultimately involve significant legal expenses. In addition to the foregoing, we have been and may be from time to time party to other legal proceedings that arise in the ordinary course of business and to other patent enforcement actions to assert our patent rights.

Item 1A. Risk Factors.

There have been no material changes to the risk factors included in our Annual Report.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

(a) *Unregistered Sales of Equity Securities* . Not applicable.

(b) *Use of Proceeds from Initial Public Offering of Common Stock* .

We regis tered shares of our common stock in connection with our initial public offering pursuant to a registration statement on Form S-1 (File No. 333-195523), which was declared effective by the SEC on June 12, 2014, and a registration statement on Form S-1 (File No. 333-196719) filed pursuant to Rule 462(b) of the Securities Act of 1933, as amended.

We received aggregate net proceeds from the offering of approximately $74.7 million, after deducting $4.3 million of underwriting discounts and approximately $3.5 million of offering expenses.

As of June 30, 2018, we have used $19.8 million of the net proceeds of the offering to repay all amounts outstanding under our subordinated notes and our revolving credit facility; $31.0 million of the net proceeds of the offering for capital expenditures related to our third production line; $7.2 million of the net proceeds of the offering for our planned manufacturing facility in Statesboro, Georgia; the remainder of the net proceeds of the offering for general corporate purposes. There was not a material change in our planned use of the balance of the net proceeds from the offering as described in our final prospectus dated June 12, 2014, filed with the SEC on June 16, 2014.

(c) *Purchases of Equity Securities By the Issuer and Affiliated Purchasers* .

We did not repurchase any of our equity securities during the quarter ended June 30, 2018.

Item 3. Defaults Upon Senior Securities.

None.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

None.

Item 6. Exhibits.

(a) Exhibits

10.1	Seventh Amendment to the Amended and Restated Loan and Security Agreement, dated April 25, 2018, by and between the Company and Silicon Valley Bank.
31.1	Certification of principal executive officer under Section 302(a) of the Sarbanes-Oxley Act of 2002.
31.2	Certification of principal financial officer under Section 302(a) of the Sarbanes-Oxley Act of 2002.
32	Certifications of the principal executive officer and the principal financial officer under Section 906 of the Sarbanes-Oxley Act of 2002.
101	The following materials from Aspen Aerogels, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2018, formatted in XBRL (eXtensible Business Reporting Language): (i) the Consolidated Balance Sheets (unaudited) as of June 30, 2018 and December 31, 2017, (ii) the Consolidated Statements of Operations (unaudited) for the three and six months ended June 30, 2018 and 2017, (iii) the Consolidated Statements of Cash Flows (unaudited) for the six months ended June 30, 2018 and 2017, and (iv) the Notes to Consolidated Financial Statements (unaudited).

SIGNA TURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

ASPEN AEROGELS, INC.

Date: August 2, 2018

By: /s/ Donald R. Young
Donald R. Young
President and Chief Executive Officer
(principal executive officer)

Date: August 2, 2018

By: /s/ John F. Fairbanks
John F. Fairbanks
Vice President, Chief Financial Officer and Treasurer
(principal financial officer and principal accounting officer)

SEVENTH A MENDMENT
TO
AMENDED AND RESTATED LOAN AND SECURITY AGREEMENT

This Seventh Amendment to Amended and Restated Loan and Security Agreement (this " **Amendment** ") is entered into this 25 th day of April, 2018 by and between **SILICON VALLEY BANK** (" **Bank** ") and **ASPEN AEROGELS, INC.** , a Delaware corporation (" **Borrower** ") whose address is 30 Forbes Road, Building B, Northborough, Massachusetts 01532.

RECITALS

A. Bank and Borrower have entered into that certain Amended and Restated Loan and Security Agreement dated as of September 3, 2014, as amended by that certain Consent and First Amendment to Amended and Restated Loan and Security Agreement dated as of August 19, 2016, as further amended by that certain Second Amendment to Amended and Restated Loan and Security Agreement dated as of November 23, 2016, as further amended by that certain Third Amendment to Amended and Restated Loan and Security Agreement dated as of December 29, 2016, as further amended by that certain Fourth Amendment to Amended and Restated Loan and Security Agreement dated as of January 27, 2017, as further amended by that certain Fifth Amendment to Amended and Restated Loan and Security Agreement dated as of September 27, 2017, and as further amended by that certain Consent and Sixth Amendment to Amended and Restated Loan and Security Agreement dated as of January 25, 2018 (as amended, and as the same may from time to time be further amended, restated, amended and restated, modified and/or supplemented, the " **Loan Agreement** ").

B. Bank has extended credit to Borrower for the purposes permitted in the Loan Agreement.

C. Borrower has requested that Ba nk amend the Loan Agreement to make certain revisions to the Loan Agreement as more fully set forth herein.

D. Bank has agreed to so amend certain provisions of the Loan Agreement, but only to the extent, in accordance with the terms, subject to the conditions and in reliance upon the representations and warranties set forth below.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, and intending to be legally bound, the parties hereto agree as follows:

1. Definitions. Capitalized terms used but not defined in this Amendment shall have the meanings given to them in the Loan Agreement.

2. Amendments to Loan Agreement.

2.1 Section 6.9(a) (Financial Covenants) . Section 6.9(a) is amended in its entirety and replaced with the following:

"(a) EBITDA . Borrower shall achieve, measured as of the end of each fiscal quarter during the following periods, EBITDA of at least (loss not worse than) the following for the following periods:

Period	Minimum EBITDA (maximum loss)
Trailing three (3) month period ending March 31, 2018	($5,000,000)
Trailing six (6) month period ending June 30, 2018	($8,000,000)
Trailing nine (9) month period ending September 30, 2018	($9,000,000)
Trailing twelve (12) month period ending December 31, 2018	($10,000,000)
Trailing three (3) month period ending March 31, 2019	($1,000,000)
Trailing six (6) month period ending June 30, 2019	($500,000)”

2.2 Section 13 (**Definitions**). The following term and its definition set forth in Section 13.1 is amended in its entirety and replaced with the following:

“ **Revolving Line Maturity Date** ” is April 28, 2019.

2.3 Exhibit B (Compliance Certificate) . The Compliance Certificate attached to the Loan Agreement as Exhibit B is amended in its entirety and replaced with the Compliance Certificate in the form of Exhibit B attached hereto.

3. Limitation of Amendments.

3.1 The amendments set forth in Section 2 above are effective for the purposes set forth herein and shall be limited precisely as written and shall not be deemed to (a) be a consent to any amendment, waiver or modification of any other term or condition of any Loan Document, or (b) otherwise prejudice any right or remedy which Bank may now have or may have in the future under or in connection with any Loan Document.

3.2 This Amendment shall be construed in connection with and as part of the Loan Documents and all terms, conditions, representations, warranties, covenants and agreements set forth in the Loan Documents, except as herein amended, are hereby ratified and confirmed and shall remain in full force and effect.

4. Representations and Warranties. To induce Bank to enter into this Amendment, Borrower hereby represents and warrants to Bank as follows:

4.1 Immediately after giving effect to this Amendment (a) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (b) no Event of Default has occurred and is continuing;

4.2 Borrower has the power and authority to execute and deliver this Amendment and to perform its obligations under the Loan Agreement, as amended by this Amendment;

4.3 The organizational documents of Borrower delivered to Bank on the Effective Date remain true, accurate and complete and have not been amended, supplemented or restated and are and continue to be in full force and effect;

4.4 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, have been duly authorized;

4.5 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not and will not contravene (a) any law or regulation binding on or affecting Borrower, (b) any contractual restriction with a Person binding on Borrower, (c) any order, judgment or decree of any court or other governmental or public body or authority, or subdivision thereof, binding on Borrower, or (d) the organizational documents of Borrower;

4.6 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not require any order, consent, approval, license, authorization or validation of, or filing, recording or registration with, or exemption by any governmental or public body or authority, or subdivision thereof, binding on Borrower, except as already has been obtained or made; and

4.7 This Amendment has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights.

5. Updated Perfection Certificate . Borrower has delivered an updated Perfection Certificate dated as of the date hereof (the " **Updated Perfection Certificate** "), which Updated Perfection Certificate shall supersede in all respects that certain Perfection Certificate dated as of January 26, 2017. Borrower and Bank acknowledge and agree that all references in the Loan Agreement to the "Perfection Certificate" shall hereinafter be deemed to be a reference to the Updated Perfection Certificate.

6. No Defenses of Borrower. Borrower hereby acknowledges and agrees that Borrower has no offsets, defenses, claims, or counterclaims against Bank with respect to the Obligations, or otherwise, and that if Borrower now has, or ever did have, any offsets, defenses, claims, or counterclaims against Bank, whether known or unknown, at law or in equity, all of them are hereby expressly WAIVED and Borrower hereby RELEASES Bank from any liability thereunder.

7. Integration . This Amendment and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Amendment and the Loan Documents merge into this Amendment and the Loan Documents.

8. Counterparts. This Amendment may be executed in any number of counterparts and all of such counterparts taken together shall be deemed to constitute one and the same instrument.

9. Fees and Expenses . Borrower agrees to promptly pay Bank, upon receipt of an invoice, Bank's legal fees and expenses incurred in connection with this Amendment.

10. Effectiveness . As a condition precedent to the effectiveness of this Amendment and the

Bank's obligation to make further Advances under the Revolving Line, the Bank shall have received the following documents prior to or concurrently with this Amendment, each in form and substance reasonably satisfactory to Bank:

10.1 this Amendment duly executed on behalf of Borrower;

10.2 the Acknowledgment of Amendment and Reaffirmation of Guaranty substantially in the form attached hereto as **Schedule 1** , duly executed and delivered by Guarantor;

10.3 Bank shall have received copies, certified by a duly authorized officer of Borrower, to be true and complete as of the date hereof, of each of (i) the governing documents of Borrower as in effect on the date hereof, (ii) the resolutions of Borrower authorizing the execution and delivery of this Amendment, the other documents executed in connection herewith and Borrower's performance of all of the transactions contemplated hereby, and (iii) an incumbency certificate giving the name and bearing a specimen signature of each individual who shall be so authorized on behalf of Borrower;

10.4 a good standing certificate of Borrower and Guarantor, certified by the jurisdiction of incorporation of Borrower, dated as of a date no earlier than thirty (30) days prior to the date hereof;

10.5 certified copies, dated as of a recent date, of financing statement and other lien searches of Borrower and Guarantor, as Bank may request and which shall be obtained by Bank, accompanied by written evidence (including any Uniform Commercial Code termination statements) that the Liens revealed in any such searched either (i) will be terminated prior to or in connection with this Amendment, or (ii) in the sole discretion of Bank, will constitute Permitted Liens;

10.6 the Updated Perfection Certificate, duly executed by Borrower;

10.7 evidence satisfactory to Bank that the insurance policies required for Borrower are in full force and effect, together with appropriate evidence showing lender loss payable and/or additional insured clauses or endorsements in favor of Bank;

10.8 Borrower's payment of a fully earned, non-refundable amendment fee in the amount of Fifty Thousand Dollars ($50,000), payable in full on the date hereof; and

10.9 such other documents as Bank may reasonably request.

11. Post-Closing Requirement . Within thirty (30) days after the date of this Amendment, Borrower shall deliver to Bank insurance endorsements showing lender loss payable and/or additional insured clauses or endorsements in favor of Bank. Failure to comply with foregoing requirement within the time period noted, or such longer period as Bank may agree in its sole discretion, shall constitute an Event of Default for which no grace or cure period shall apply.

[Signature page follows.]

In Witness Whereof, the parties hereto have caused this Amendment to be duly executed and delivered as of the date first written above.

BANK	**BORROWER**
SILICON VALLEY BANK	ASPEN AEROGELS, INC.
By: /s/ Danny Donovan	By: /s/ John F. Fairbanks
Name: Danny Donovan	Name: John F. Fairbanks
Title: VP	Title: Chief Financial Officer

Schedule 1

ACKNOWELDGMENT OF AMENDMENT
AND REAFFIRMATION OF GUARANTY

Section 1. Guarantor hereby acknowledges and confirms that it has reviewed and approved the terms and conditions of the Seventh Amendment to Amended and Restated Loan and Security Agreement dated as of the date hereof ("the " **Amendment** ").

Section 2. Guarantor hereby consents to the Amendment and agrees that the Guaranty relating to the Obligations of Borrower under the Loan Agreement shall continue in full force and effect, shall be valid and enforceable and shall not be impaired or otherwise affected by the execution of the Amendment or any other document or instruction delivered in connection herewith.

Section 3. Guarantor represents and warrants that, after giving effect to the Amendment, all representations and warranties contained in the Guaranty are true, accurate and complete as if made the date hereof.

Dated as of April 25, 2018.

GUARANTOR : ASPEN AEROGELS RHODE ISLAND LLC

By: /s/John F. Fairbanks

Name: John F. Fairbanks

Title: Chief Financial Officer

EXHIBIT B

COMPLIANCE CERTIFICATE

TO: SILICON VALLEY BANKDate:
FROM: ASPEN AEROGELS, INC.

The undersigned authorized officer of Aspen Aerogels, Inc. (" **Borrower** ") certifies that under the terms and conditions of the Amended and Restated Loan and Security Agreement between Borrower and Bank (as amended and in effect, the " **Agreement** "), (1) Borrower is in complete compliance for the period ending _______________ with all required covenants except as noted below, (2) there are no Events of Default, (3) all representations and warranties in the Agreement are true and correct in all material respects on this date except as noted below; provided , however , that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided , further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date , (4) Borrower, and each of its Subsidiaries, has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except as otherwise permitted pursuant to the terms of Section 5.9 of the Agreement, and (5) no Liens have been levied or claims made against Borrower or any of its Subsidiaries, if any, relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Bank. Attached are the required documents supporting the certification. The undersigned certifies that these are prepared in accordance with GAAP consistently applied from one period to the next except as explained in an accompanying letter or footnotes. The undersigned acknowledges that no borrowings may be requested at any time or date of determination that Borrower is not in compliance with any of the terms of the Agreement, and that compliance is determined not just at the date this certificate is delivered. Capitalized terms used but not otherwise defined herein shall have the meanings given them in the Agreement.

Please indicate compliance status by circling Yes/No under "Complies" column.

Reporting Covenant	Required	Complies
Monthly financial statements with Compliance Certificate	Monthly within 30 days	Yes No
Quarterly financial statements	Quarterly within 45 days	Yes No
Annual financial statement (CPA Audited) + CC	FYE within 150 days	Yes No
10-Q, 10-K and 8-K	Within 5 days after filing with SEC	Yes No
A/R & A/P Agings, and Deferred Revenue reports	Monthly within 20 days	Yes No
Borrowing Base Reports and Inventory reports	15 th and last Business Day of each month (monthly within 20 days when a Streamline Period is in effect) and with each request for a Credit Extension;	Yes No
Projections	FYE within 30 days	Yes No
The following Intellectual Property was registered after the Effective Date (if no registrations, state "None")		

Financial Covenant	Required	Actual	Complies
Maintain as indicated:			
Minimum EBITDA	*	$	Yes No
Minimum Adjusted Quick Ratio	1.25:1.00	:1.00	Yes No

*See Section 6.9(a)

Performance Pricing		Applies
Adjusted Quick Ratio at least 1.50:1.00	Prime + 0.75% (Eligible Accounts) or Prime + 1.25% (Eligible Foreign Accounts and Eligible Inventory); LIBOR + 3.75% (Eligible Accounts) or LIBOR +4.25% (Eligible Foreign Accounts and Eligible Inventory)	Yes No
Adjusted Quick Ratio less than 1.50:1.00	Prime + 1.50% (Eligible Accounts); Prime + 2.00% (Eligible Foreign Accounts and Eligible Inventory)	Yes No

The following financial covenant analyses and information set forth in Schedule 1 attached hereto are true and accurate as of the date of this Certificate.

The following are the exceptions with respect to the certification above: (If no exceptions exist, state "No exceptions to note.")

ASPEN AEROGELS, INC.

By:
Name:
Title:

BANK USE ONLY

Received by: ______________________
AUTHORIZED SIGNER
Date: __________________________
Verified: ________________________
AUTHORIZED SIGNER
Date: __________________________
Compliance Status: Yes No

Schedule 1 to Compliance Certificate

Financial Covenants of Borrower

In the event of a conflict between this Schedule and the Loan Agreement, the terms of the Loan Agreement shall govern.

I. **EBITDA** (Section 6.9(a))

Required: Borrower shall achieve, measured as of the end of each fiscal quarter during the following periods, EBITDA of at least (loss not worse than) the following for the following periods:

Period	Minimum EBITDA (maximum loss)
Trailing three (3) month period ending March 31, 2018	($5,000,000)
Trailing six (6) month period ending June 30, 2018	($8,000,000)
Trailing nine (9) month period ending September 30, 2018	($9,000,000)
Trailing twelve (12) month period ending December 31, 2018	($10,000,000)
Trailing three (3) month period ending March 31, 2019	($1,000,000)
Trailing six (6) month period ending June 30, 2019	($500,000)

Actual:

A. Net Income

B. To the extent included in the determination of Net Income

1.The provision for income taxes

2.Depreciation expense

3.Amortization expense

4.Net Interest Expense

5.Non-cash stock compensation expense

6.The sum of lines 1 through 5

C. EBITDA (line A plus line B.6)

Is line C equal to or greater than $___________?

No, not in compliance Yes, in compliance

II. **M inimum Adjusted Quick Ratio** (Section 6.9(b))

Required: Maintain at all times, to be certified to Bank monthly as of the last day of each month, an Adjusted Quick Ratio of at least 1.25 to 1.00.

Actual:

A. Aggregate value of the unrestricted cash of Borrower maintained with Bank

B. Aggregate value of accounts receivable of Borrower, net of allowances for bad debt

C. Quick Assets (the sum of lines A and B)

D. Aggregate value of Obligations to Bank

E. Without duplication of line D, the aggregate value of liabilities of Borrower (including all Indebtedness) that matures within one (1) year, but excluding all Subordinated Debt

F. Current Liabilities (the sum of lines D and E)

G. Aggregate value of all amounts received or invoiced by Borrower in advance of performance under contracts and not yet recognized as revenue

H. The Dollar Equivalent amount of all outstanding Letters of Credit

I. Line F minus line G minus line H

J. Adjusted Quick Ratio (line C divided by line I)

Is line J equal to or greater than 1.25 to 1.00?

No, not in compliance Yes, in compliance

Exhibit 31.1

CERTIFICATIONS UNDER SECTION 302

I, Donald R. Young, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Aspen Aerogels, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 2, 2018

/s/ Donald R. Young
Donald R. Young
President and Chief Executive Officer
(principal executive officer)

Exhibit 31.2

CERTIFICATIONS UNDER SECTION 302

I, John F. Fairbanks, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Aspen Aerogels, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 2, 2018

/s/ John F. Fairbanks

John F. Fairbanks
Vice President, Chief Financial Officer and Treasurer (principal financial officer and principal accounting officer)

Exhibit 32

CERTIFICATIONS UNDER SECTION 906

Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), each of the undersigned officers of Aspen Aerogels, Inc., a Delaware corporation (the “Company”), does hereby certify, to such officer’s knowledge, that:

The Quarterly Report on Form 10-Q for the quarter ended June 30, 2018 (the “Form 10-Q”) of the Company fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and the information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: August 2, 2018	/s/ Donald R. Young
	Donald R. Young President and Chief Executive Officer (principal executive officer)
Dated: August 2, 2018	/s/ John F. Fairbanks
	John F. Fairbanks Vice President, Chief Financial Officer and Treasurer (principal financial officer and principal accounting officer)

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.