

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM S-3

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

AXCELIS TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation or organization)

34-1818596
(I.R.S. Employer
Identification Number)

**108 Cherry Hill Drive
Beverly, Massachusetts 01915
(978) 787-4000**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Lynnette C. Fallon
Executive Vice President, Human Resources/Legal and General Counsel
Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, Massachusetts 01915
(978) 787-4000**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

with copies to:

**Matthew C. Dallett
Locke Lord LLP
111 Huntington Avenue
Boston, Massachusetts 02199
(617) 239-0100**

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

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

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

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

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

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

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

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

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

CALCULATION OF REGISTRATION FEE

| Title of each class of securities to be registered | Amount to be Registered | Proposed Maximum Offering Price Per Unit | Proposed Maximum Aggregate Offering Price | Amount of Registration Fee(1) |
|--|-------------------------|--|---|-------------------------------|
| Common Stock, \$0.001 par value per share | (2) | (3) | (3) | (3) |
| Preferred stock, \$0.001 par value per share | (2) | (3) | (3) | (3) |
| Warrants | (2) | (3) | (3) | (3) |
| Debt Securities | (2) | (3) | (3) | (3) |
| Units | (2) | (3) | (3) | (3) |
| Total | | | \$ 75,000,000 | \$ 8,692.50 |

(1) Calculated pursuant to Rule 457(o) under the Securities Act.

(2) There are being registered hereunder such indeterminate number of shares of common stock and preferred stock, such indeterminate principal amount of debt securities, such indeterminate number of warrants to purchase common stock, preferred stock or debt securities, and such indeterminate number of units as shall have an aggregate initial offering price not to exceed \$75,000,000. If any debt securities are issued at an original issue discount, then the offering price of such debt securities shall be in such greater principal amount as shall result in an aggregate initial offering price not to exceed \$75,000,000, less the aggregate dollar amount of all securities previously issued hereunder. Any securities registered hereunder may be sold separately or as units with other securities registered hereunder. The proposed maximum initial offering price per unit will be determined, from time to time, by the registrant in connection with the issuance by the registrant of the securities registered hereunder. Pursuant to Rule 457(i), the securities registered also include such indeterminate number of shares of common stock and preferred stock and amount of debt securities as may be issued upon conversion of or exchange for preferred stock or debt securities that provide for conversion or exchange, upon exercise of warrants or pursuant to the antidilution provisions of any such securities. In addition, pursuant to Rule 416 under the Securities Act, the shares being registered hereunder include such indeterminate number of shares of common stock and preferred stock as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions.

(3) The proposed maximum aggregate offering price per class of security will be determined from time to time by the registrant in connection with the issuance by the registrant of the securities registered hereunder and is not specified as to each class of security pursuant to General Instruction II.D. of Form S-3 under the Securities Act.

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



Axcelis Technologies, Inc.

\$75,000,000

Common stock
Preferred stock
Warrants
Debt Securities
Units

The aggregate initial offering price of the securities that we offer will not exceed \$75,000,000. We will offer the securities in amounts, at prices and on terms to be determined at the time of the offering.

When we offer securities, we will provide you with a prospectus supplement or term sheet describing the specific terms of the specific issue of securities, including the offering price of the securities. You should carefully read this prospectus and the prospectus supplements or term sheets relating to the specific issue of securities together with additional information described under the heading “Where You Can Find More Information” beginning on Page 22 of this prospectus before you decide to invest in any of these securities.

Our common stock is quoted on The NASDAQ Global Select Market under the symbol “ACLS”. On April 6, 2017, the last reported sale price for the common stock was \$18.10 per share.

In this prospectus, “Axcelis,” “we,” “us,” and “our” refer to Axcelis Technologies, Inc. and its subsidiaries.

These securities may be sold directly by us, through dealers or agents designated from time to time, to or through underwriters or through a combination of these methods. See “Plan of Distribution” beginning on Page 20 of this prospectus. We may also describe the plan of distribution for any particular offering of these securities in any applicable prospectus supplement. If any agents, underwriters or dealers are involved in the sale of any securities in respect of which this prospectus is being delivered, we will disclose their names and the nature of our arrangements with them in a prospectus supplement and any applicable fees, commissions or discounts. The net proceeds we expect to receive from any such sale will also be included in any prospectus supplement.

INVESTING IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. SEE “RISK FACTORS” ON PAGE 2.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR PASSED UPON THE ADEQUACY OR ACCURACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

This prospectus may not be used to sell securities unless it is accompanied by a prospectus supplement.

Prospectus dated _____, 2017

[Table of Contents](#)

TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------|
| ABOUT THIS PROSPECTUS | 1 |
| AXCELIS TECHNOLOGIES, INC. | 1 |
| RISK FACTORS | 2 |
| FORWARD-LOOKING STATEMENTS | 3 |
| USE OF PROCEEDS | 4 |
| RATIO OF EARNINGS TO FIXED CHARGES | 4 |
| DESCRIPTION OF CAPITAL STOCK | 5 |
| DESCRIPTION OF DEBT SECURITIES | 8 |
| DESCRIPTION OF WARRANTS | 16 |

| | |
|---|----|
| DESCRIPTION OF UNITS | 18 |
| PLAN OF DISTRIBUTION | 20 |
| LEGAL MATTERS | 21 |
| EXPERTS | 22 |
| WHERE YOU CAN FIND MORE INFORMATION | 22 |
| INCORPORATION BY REFERENCE | 23 |

[Table of Contents](#)

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or SEC, using a “shelf” registration process. Under this shelf registration process, we may offer to sell any combination of the securities described in this prospectus, either individually or in units, in one or more offerings, with a total value of up to \$75,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities under this prospectus, we will provide a prospectus supplement that will contain more specific information about the terms of those securities. We also may authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. We may also add, update or change in a prospectus supplement or free writing prospectus any of the information contained in this prospectus or in documents we have incorporated by reference into this prospectus. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness. This prospectus, together with the applicable prospectus supplements, free writing prospectuses and the documents incorporated by reference into this prospectus, includes all material information relating to this offering. You should carefully read this prospectus, the applicable prospectus supplement and the additional information described under “Where You Can Find More Information” before buying securities in this offering.

You should rely only on the information we have provided or incorporated by reference in this prospectus, any prospectus supplement and any related free writing prospectus that we may authorize to be provided to you. We have not authorized anyone to provide you with information different from that contained or incorporated by reference in this prospectus. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained or incorporated by reference in this prospectus. You must not rely on any unauthorized information or representation. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. You should assume that the information in this prospectus, any prospectus supplement or related free writing prospectus is accurate only as of the date on the front of the document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus or any sale of a security.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed or will be filed as exhibits to the registration statement of which this prospectus is a part (or will be incorporated by reference from a current report on Form 8-K, quarterly report on Form 10-Q or annual report on Form 10-K that we file with the SEC), and you may obtain copies of those documents as described below under “Where You Can Find More Information.”

AXCELIS TECHNOLOGIES, INC.

Axcelis designs, manufactures and services ion implantation and other processing equipment used in the fabrication of semiconductor chips. Axcelis’ business commenced in 1978 and its current corporate entity was incorporated in Delaware in 1995, and is headquartered in Beverly, Massachusetts. Our principal executive offices are located at 108 Cherry Hill Drive, Beverly, Massachusetts 01915, and our telephone number there is (978) 787-4000.

[Table of Contents](#)

RISK FACTORS

An investment in our common stock involves a high degree of risk. You should carefully consider the risk factors contained in a prospectus supplement as well as those set forth in our most recently filed periodic reports filed with the SEC, including our Annual Report on Form 10-K for the year ended December 31, 2016, as revised or supplemented by our quarterly reports on Form 10-Q, each of which are on file with the SEC and are incorporated by reference into this prospectus. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus or include in any applicable prospectus supplement. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled “Forward-Looking Statements.”

[Table of Contents](#)

FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference in this prospectus include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Any statement that is not a statement of historical fact should be considered a forward-looking statement. We often use words or phrases of expectation or uncertainty like “believe,” “anticipate,” “plan,” “expect,” “intent,” “project,” “future,” “may,” “will,” “could,” “would” and similar words to help identify forward-looking statements. Examples of forward-looking statements include statements regarding our future financial results, operating results, business strategies, projected costs, product development or future sales, competitive positions and plans and objectives of management for future operations.

We have based these forward-looking statements on our current expectations and projections about future events. However, they are subject to various risks and uncertainties, many of which are outside our control, including the timing of orders and shipments, the conversion of orders to revenue in any particular quarter, or at all, the continuing demand for semiconductor equipment, relative market growth, continuity of business relationships with and purchases by major customers, competitive pressure on sales and pricing, increases in material and other production costs that cannot be recouped in product pricing, global economic, political and financial conditions, and the information incorporated herein under the caption “Risk Factors.” Accordingly, our actual results or financial condition could differ materially and adversely from those discussed in, or implied by, these forward-looking statements.

All later written and oral forward-looking statements attributable to us or a person acting on our behalf are expressly qualified in their entirety by the applicable cautionary statements. Each forward-looking statement speaks only as of the date on which it is made, and, except to the extent required by federal securities laws, we undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

We caution you not to place undue reliance on our forward-looking statements. You should carefully read this entire prospectus and the documents incorporated by reference in this prospectus, particularly the section entitled “Risk Factors.”

3

[Table of Contents](#)

USE OF PROCEEDS

We intend to use the net proceeds from the sale of any securities offered under this prospectus for general corporate purposes and/or as indicated in the applicable prospectus supplement. Such purposes may include working capital, capital expenditures, repayment and refinancing of debt, the acquisition of companies, businesses, technology or other assets, stock repurchases and the payment of dividends. We have not determined the amount of net proceeds to be used specifically for any such purposes. As a result, management will retain broad discretion over the allocation of the net proceeds. We expect to temporarily invest the net proceeds in short-term investments until they are used for their intended purpose.

RATIO OF EARNINGS TO FIXED CHARGES

The following table sets forth our ratio of earnings to fixed charges and the dollar amount of the coverage deficiency, if any, for each of the periods indicated. For purposes of this calculation, “earnings” consist of pre-tax net income (loss) from continuing operations plus fixed charges and amortization of capitalized interest. “Fixed charges” means the sum of interest expense and an estimate of the interest portion of rental expense under operating leases. We have not issued preferred stock and, accordingly, no preferred stock dividends were declared or paid for any of the periods presented.

| (dollars in millions) | Year Ended | | | | |
|------------------------------------|------------------|-----------------|------------------|------------------|------------------|
| | Dec. 31, 2012 | Dec. 31 2013 | Dec. 31, 2014 | Dec. 31, 2015 | Dec. 31, 2016 |
| Ratio of Earnings to Fixed Charges | (A) | (A) | (A) | 3.9 | 3.1 |
| Coverage Deficiency | \$ 32.1 | \$ 15.4 | \$ 8.7 | \$ — | \$ — |

(A) Our earnings were insufficient to cover fixed charges.

This information should be read in conjunction with our consolidated financial statements and the accompanying notes incorporated by reference in this prospectus.

4

[Table of Contents](#)

DESCRIPTION OF CAPITAL STOCK

Our authorized capital stock currently consists of 75,000,000 shares of common stock, par value \$0.001 per share, and 30,000,000 shares of preferred stock, \$0.001 par value per share. As of December 31, 2016, approximately 29,520,000 shares of common stock were issued and outstanding and an aggregate of approximately 5,500,000 shares were reserved for issuance under outstanding restricted stock units and options to purchase common stock. No shares of preferred stock were outstanding.

The following summary of certain provisions of our common and preferred stock does not purport to be complete. You should refer to our amended and restated certificate of incorporation, as amended (“certificate of incorporation”) and by-laws, which are filed as exhibits to the registration statement of which this prospectus is a part. The summary below is also qualified by provisions of applicable law.

Common Stock

Holders of common stock are entitled to one vote per share on matters on which our stockholders vote. There are no cumulative voting rights. Holders of common stock are entitled to receive dividends, if declared by our board of directors, out of funds that we may legally use to pay dividends. See “Dividend

Policy.” If we liquidate or dissolve, holders of common stock are entitled to share ratably in our assets once our debts and any liquidation preference owed to holders of preferred stock are paid. All shares of common stock that are outstanding as of the date of this prospectus are fully-paid and nonassessable.

Preferred Stock

We are currently authorized to issue 30,000,000 shares of preferred stock, of which 3,000,000 shares have been designated as Series A Participating Preferred Stock. Our board of directors has the authority to issue the remaining shares of preferred stock in one or more series and to fix the rights of each series. Our board would fix the designations, voting powers, preferences and rights of the preferred stock of each series, as well as the qualifications, limitations or restrictions thereof, in a certificate of designation relating to that series. We would file as an exhibit to the registration statement of which this prospectus is a part, or would incorporate by reference from reports that we file with the SEC, the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of that series of preferred stock. This description would include the following items, as applicable:

- the title and stated value;
- the number of shares we are offering;
- the liquidation preference per share;
- the purchase price;
- the dividend rate, period and payment date and method of calculation for dividends;
- whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;
- the procedures for any auction and remarketing, if any;
- the provisions for a sinking fund, if any;
- the provisions for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;

[Table of Contents](#)

- any listing of the preferred stock on any securities exchange or market;
- whether the preferred stock will be convertible into our common stock, and, if applicable, the conversion price, or how it will be calculated, and the conversion period;
- whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange price, or how it will be calculated, and the exchange period;
- voting rights, if any;
- preemptive rights, if any;
- restrictions on transfer, sale or other assignment, if any;
- whether interests in the preferred stock will be represented by depositary shares;
- a discussion of any material U.S. federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;
- any limitations on the issuance of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and
- any other specific terms, preferences, rights or limitations of, or restrictions on, the preferred stock.

The General Corporation Law of the State of Delaware, our state of incorporation, provides that the holders of preferred stock will have the right to vote separately as a class (or, in some cases, as a series) on an amendment to our certificate of incorporation if the amendment would change the par value or, unless the certificate of incorporation provided otherwise, the number of authorized shares of the class or change the powers, preferences or special rights of the class or series so as to adversely affect the class or series, as the case may be. This right is in addition to any voting rights that may be provided for in the applicable certificate of designation.

We believe the power to issue preferred stock will provide our board of directors with flexibility in connection with certain possible corporate transactions. The issuance of preferred stock could, however, adversely affect the voting power of holders of our common stock, restrict their rights to receive payment upon liquidation, and have the effect of delaying, deferring, or preventing a change in control. We have no present plans to issue any shares of preferred stock.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We currently intend to retain our future earnings, if any, for use in our business and therefore do not anticipate paying cash dividends in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our board of

directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs and plans for expansion. In addition, should we enter into a bank credit facility, our ability to pay dividends may be restricted.

[Table of Contents](#)

Delaware Anti-Takeover Law

We are subject to Section 203 of the Delaware General Corporation Law, an anti-takeover law. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years following the date the person became an interested stockholder, unless the business combination or the transaction in which the person became an interested stockholder is approved in a prescribed manner. Generally, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. Generally, an “interested stockholder” is a person who, together with affiliates and associates, owns or within three years before the determination of interested stockholder status, did own, 15% or more of the corporation’s voting stock. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by our board of directors, including discouraging attempts that might result in a premium over the market price for the outstanding shares of our common stock.

Charter and By-law Provisions

In addition to the board of directors’ ability to issue shares of preferred stock, our certificate of incorporation and by-laws contain the following provisions that may have the effect of discouraging unsolicited acquisition proposals or making more difficult the removal of our incumbent directors and officers (but that are designed to encourage persons seeking to acquire control of us first to negotiate with our board of directors). In each case subject to the rights of the holders of any series of preferred stock:

- special meetings of stockholders may only be called by the Chief Executive Officer, Chairman of the Board or board of directors;
- stockholders do not have the power to take any action by written consent without a meeting;
- the board of directors may enlarge the size of the board and has the right to fill vacancies;
- directors may be removed only (a) for cause by holders of a majority of the outstanding shares of voting stock and (b) without cause by holders of at least 75% of the outstanding shares of voting stock;
- certain provisions of the certificate of incorporation may only be changed by an affirmative vote of 75% of our outstanding capital stock, in addition to any other vote required by law; and
- a stockholder may not nominate any candidate for the board of directors at any annual or special meeting, or bring any other business before an annual meeting, unless that stockholder notifies us of its intention a specified period in advance and provides us with certain required information.

Listing

Our common stock is listed on The Nasdaq Global Select Market under the symbol “ACLS.”

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A.

[Table of Contents](#)

DESCRIPTION OF DEBT SECURITIES

If we issue any debt securities offered by this prospectus and any accompanying prospectus supplement, we would issue them under an indenture to be entered into by Axcelis and a trustee to be identified in the applicable prospectus supplement. The terms of the debt securities would include those stated in the indenture and those made part of the indenture by reference to the Trust Indenture Act of 1939, as in effect on the date of the indenture. We have filed a copy of the proposed form of indenture as an exhibit to the registration statement in which this prospectus is included. Each indenture would be subject to and governed by the terms of the Trust Indenture Act of 1939.

We may offer under this prospectus up to \$75,000,000 aggregate principal amount of debt securities; or if debt securities are issued at a discount, or in a foreign currency, foreign currency units or composite currency, the principal amount as may be sold for an initial public offering price of up to \$75,000,000. Unless otherwise specified in the applicable prospectus supplement, the debt securities would represent direct, unsecured obligations of Axcelis that would rank equally with all of our other unsecured indebtedness and would be effectively subordinated to all of our secured debts.

The following statements relating to the debt securities and the indenture are summaries and do not purport to be complete, and are subject in their entirety to the detailed provisions of the indenture.

General

We may issue the debt securities in one or more series with the same or various maturities, at par, at a premium, or at a discount. We will describe the particular terms of each series of debt securities in a prospectus supplement relating to that series, which we will file with the SEC. To review the terms of a series of debt securities, you must refer to both the prospectus supplement for the particular series and to the description of debt securities in this prospectus.

The prospectus supplement would set forth the following terms of the debt securities in respect of which this prospectus is delivered:

- (1) the title;
- (2) the aggregate principal amount;
- (3) the issue price or prices (expressed as a percentage of the aggregate principal amount thereof);
- (4) any limit on the aggregate principal amount;
- (5) the date or dates on which principal is payable;
- (6) the interest rate or rates (which may be fixed or variable) or, if applicable, the method used to determine the rate or rates;
- (7) the date or dates from which the interest, if any, will be payable and any regular record date for the interest payable;
- (8) the place or places where principal and, if applicable, premium and interest, is payable;
- (9) the terms and conditions upon which Axcelis may, or the holders may require Axcelis to, redeem or repurchase the debt securities;
- (10) the denominations in which the debt securities may be issuable, if other than denominations of \$1,000 or any integral multiple thereof;

8

[Table of Contents](#)

- (11) whether the debt securities are to be issuable in the form of certificated debt securities (as described below) or global debt securities (as described below);
- (12) the portion of principal amount that will be payable upon declaration of acceleration of the maturity date if other than the principal amount of the debt securities;
- (13) the currency of denomination;
- (14) the designation of the currency, currencies or currency units in which payment of principal and, if applicable, premium and interest, will be made;
- (15) if payments of principal and, if applicable, premium or interest, on the debt securities are to be made in one or more currencies or currency units other than the currency of denomination, the manner in which the exchange rate with respect to these payments will be determined;
- (16) if amounts of principal and, if applicable, premium and interest may be determined (a) by reference to an index based on a currency or currencies other than the currency of denomination or designation or (b) by reference to a commodity, commodity index, stock exchange index or financial index, then the manner in which these amounts will be determined;
- (17) the provisions, if any, relating to any security provided for the debt securities;
- (18) any addition to or change in the covenants and/or the acceleration provisions described in this prospectus or in the indenture;
- (19) any events of default;
- (20) the terms and conditions for conversion into or exchange for shares of common stock or preferred stock;
- (21) any other terms, which may modify or delete any provision of the indenture insofar as it applies to that series;
- (22) any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents; and
- (23) the terms and conditions, if any, upon which the debt securities shall be subordinated in right of payment to other indebtedness of Axcelis.

We may issue discount debt securities that provide for an amount less than the stated principal amount to be due and payable upon acceleration of the maturity of the debt securities in accordance to the terms of the indenture. We may also issue debt securities in bearer form, with or without coupons. If we issue discount securities or debt securities in bearer form, we would describe United States federal income tax considerations and other special considerations that apply to the debt securities in the applicable prospectus supplement.

We may issue debt securities denominated in or payable in a foreign currency or currencies or a foreign currency unit or units. If we do so, we would describe the restrictions, elections, general tax considerations, specific terms and other information with respect to the issue of debt securities and the foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Exchange and/or Conversion Rights

If we issue debt securities that may be exchanged for or converted into shares of common stock or preferred stock, we would describe the terms of exchange or conversion in the prospectus supplement relating to those debt securities.

9

Transfer and Exchange

We may issue debt securities that would be represented by either:

- (1) “book-entry securities,” which means that there will be one or more global securities registered in the name of The Depository Trust Company, as depository, or a nominee of the depository; or
- (2) “certificated securities,” which means that they will be represented by a certificate issued in definitive registered form.

We would specify in the prospectus supplement applicable to a particular offering whether the debt securities offered will be book-entry or certificated securities. Except as set forth under “Global Debt Securities and Book Entry System” below, book-entry debt securities would not be issuable in certificated form.

Certificated Debt Securities

If you hold certificated debt securities that have been offered by this prospectus, you may transfer or exchange them at the trustee’s office or at the paying agency in accordance with the terms of the indenture. You would not be charged a service charge for any transfer or exchange of certificated debt securities, but may be required to pay an amount sufficient to cover any tax or other governmental charge payable in connection with the transfer or exchange.

You may effect the transfer of certificated debt securities and of the right to receive the principal of, premium and/or interest, if any, on your certificated debt securities only by surrendering the certificate representing your certificated debt securities and having us or the trustee issue a new certificate to the new holder.

Global Debt Securities and Book-Entry System

If we decided to issue debt securities in the form of one or more global securities, then we would register the global securities in the name of the depository for the global securities or in the nominee of the depository, and the global securities would be delivered by the trustee to the depository for credit to the accounts of the holders of beneficial interest in the debt securities. Each global security would:

- be registered in the name of a depository, or its nominee, that we would identify in a prospectus supplement;
- be deposited with the depository or nominee or custodian; and
- bear any required legends.

No global security may be exchanged in whole or in part for debt securities registered in the name of any person other than the depository or any nominee unless:

- the depository has notified us that it is unwilling or unable to continue as depository or has ceased to be qualified to act as depository, and in either case, we do not appoint a successor depository.
- an event of default has occurred and is continuing with respect to the debt securities of the applicable series; or
- any other circumstance described in a prospectus supplement has occurred permitting or requiring the issuance of any such security.

As long as the depository, or its nominee, is the registered owner of a global security, the depository or nominee would be considered the sole owner and holder of the debt securities represented by the global security for all

purposes under the indentures. Except in the above limited circumstances, owners of beneficial interests in a global security would not be:

- entitled to have the debt securities registered in their names;
- entitled to physical delivery of certificated debt securities; or
- considered to be holders of those debt securities under the indenture.

Payments on a global security would be made to the depository or its nominee as the holder of the global security. Some jurisdictions have laws that require that certain purchasers of securities take physical delivery of such securities in definitive form. These laws may impair the ability to transfer beneficial interests in a global security.

Institutions that have accounts with the depository or its nominee are referred to as “participants.” Ownership of beneficial interests in a global security would be limited to participants and to persons that may hold beneficial interests through participants. The depository would credit, on its book-entry registration and transfer system, the respective principal amounts of debt securities represented by the global security to the accounts of its participants.

Ownership of beneficial interests in a global security would be shown on and effected through records maintained by the depository, with respect to participants’ interests, or any participant, with respect to interests of persons held by participants on their behalf.

Payments, transfers and exchanges relating to beneficial interests in a global security would be subject to policies and procedures of the depository. The depository policies and procedures may change from time to time. Neither any trustee nor we would have any responsibility or liability for the depository’s or

any participant's records with respect to beneficial interests in a global security.

The prospectus supplement would describe the specific terms of the depositary arrangement for debt securities of a series that are issued in global form. Axcelis and its agents, the trustee, and any of its agents would not have any responsibility or liability for any aspect of the records relating to or payments made on account of beneficial ownership interests in the global debt security or for maintaining, supervising or reviewing any records relating to the beneficial ownership interests.

No Protection in the Event of Change of Control

The indenture does not have any covenants or other provisions providing for a put or increased interest or otherwise that would afford holders of debt securities additional protection in the event of a recapitalization transaction, a change of control of Axcelis or a highly leveraged transaction. If we offer any covenants of this type or provisions with respect to any debt securities in the future, we would describe them in the applicable prospectus supplement.

Covenants

Unless otherwise indicated in this prospectus or a prospectus supplement, the debt securities would not have the benefit of any covenants that limit or restrict our business or operations, the pledging of our assets or the incurrence by us of indebtedness. We would describe in the applicable prospectus supplement any material covenants of a series of debt securities.

Consolidation, Merger and Sale of Assets

We have agreed in the indenture that we would not consolidate with or merge into any other person or convey, transfer, sell or lease our properties and assets substantially as an entirety to any person, unless:

- (1) the person formed by the consolidation or into or with which we are merged or the person to which our properties and assets are conveyed, transferred, sold or leased, is a corporation organized and existing

[Table of Contents](#)

under the laws of the United States, any State thereof or the District of Columbia and, if we are not the surviving person, the surviving person has expressly assumed all of our obligations, including the payment of the principal of and, premium, if any, and interest on the debt securities and the performance of the other covenants under the indenture; and

- (2) immediately after giving effect to the transaction, no event of default, and no event which, after notice or lapse of time or both, would become an event of default, has occurred and is continuing under the indenture.

Events of Default

Unless otherwise specified in the applicable prospectus supplement, the following events would be events of default under the indenture with respect to debt securities of any series:

- (1) we fail to pay any principal of, or premium, if any, when it becomes due;
- (2) we fail to pay any interest within 45 days after it becomes due;
- (3) we fail to observe or perform any other covenant in the debt securities or the indenture for 45 days after written notice from the trustee or the holders of not less than 25% in aggregate principal amount of the outstanding debt securities of that series; and
- (4) certain events occur involving bankruptcy, insolvency or reorganization of Axcelis or any of our significant subsidiaries.

The trustee may withhold notice to the holders of the debt securities of any series of any default, except in payment of principal or premium, if any, or interest on the debt securities of that series, if the trustee considers it to be in the best interest of the holders of the debt securities of that series to do so.

If an event of default (other than an event of default resulting from certain events of bankruptcy, insolvency or reorganization) occurs, and is continuing, then the trustee or the holders of not less than 25% in aggregate principal amount of the outstanding debt securities of any series may accelerate the maturity of the debt securities.

If this happens, the entire principal amount of all the outstanding debt securities of that series plus accrued interest to the date of acceleration would be immediately due and payable. At any time after an acceleration, but before a judgment or decree based on the acceleration is obtained by the trustee, the holders of a majority in aggregate principal amount of outstanding debt securities of that series may rescind and annul the acceleration if (1) all events of default (other than nonpayment of accelerated principal, premium or interest) have been cured or waived, (2) all overdue interest and overdue principal has been paid and (3) the rescission would not conflict with any judgment or decree.

If an event of default resulting from certain events of bankruptcy, insolvency or reorganization occurs, the principal, premium and interest amount with respect to all of the debt securities of any series shall be due and payable immediately without any declaration or other act on the part of the trustee or the holders of the debt securities of that series.

The holders of a majority in principal amount of the outstanding debt securities of a series shall have the right to waive any existing default or compliance with any provision of the indenture or the debt securities of that series and to direct the time, method and place of conducting any proceeding for any remedy available to the trustee, subject to certain limitations specified in the indenture.

No holder of any debt security of a series would have any right to institute any proceeding with respect to the indenture or for any remedy under the indenture, unless:

(1) the holder gives to the trustee written notice of a continuing event of default;

[Table of Contents](#)

(2) the holders of at least 25% in aggregate principal amount of the outstanding debt securities of that series make a written request and offer reasonable indemnity to the trustee to institute proceeding as a trustee;

(3) the trustee fails to institute proceeding within 60 days of the request; and

(4) the holders of a majority in aggregate principal amount of the outstanding debt securities of that series do not give the trustee a direction inconsistent with their request during the 60-day period.

However, these limitations do not apply to a suit instituted for payment on debt securities of any series on or after the due dates expressed in the debt securities.

Modification and Waiver

From time to time, we and the trustee may, without the consent of holders of the debt securities of one or more series, amend the indenture or the debt securities of one or more series, or supplement the indenture, for certain specified purposes, including:

(1) to provide that the surviving entity following a change of control of Axcelis permitted under the indenture shall assume all of our obligations under the indenture and debt securities;

(2) to provide for uncertificated debt securities in addition to certificated debt securities;

(3) to comply with any requirements of the SEC under the Trust Indenture Act of 1939;

(4) to cure any ambiguity, defect or inconsistency, or make any other change that does not adversely affect the rights of any holder;

(5) provide for the issuance of and establish the form and terms and conditions of debt securities of any series as permitted by the indenture; and

(6) to appoint a successor trustee under the indenture with respect to one or more series.

From time to time we and the trustee may, with the consent of holders of at least a majority in principal amount of the outstanding debt securities, amend or supplement the indenture or the debt securities, or waive compliance in a particular instance by us with any provision of the indenture or the debt securities; but without the consent of each holder affected by the action, we may not modify or supplement the indenture or the debt securities or waive compliance with any provision of the indenture or the debt securities in order to:

(1) reduce the amount of debt securities whose holders must consent to an amendment, supplement, or waiver to the indenture or the debt security;

(2) reduce the rate of or change the time for payment of interest;

(3) reduce the principal of or premium on or change the stated maturity or postpone the payment date of any sinking fund or analogous obligation;

(4) make any debt security payable in money other than that stated in the debt security;

(5) change the amount or time of any payment required or reduce the premium payable upon any redemption, or change the time before which no redemption of this type may be made;

(6) waive a default on the payment of the principal of, interest on, or redemption payment (except if acceleration of any series has been rescinded and the resulting payment default was waived by the holders of a majority in principal amount of that series); and

[Table of Contents](#)

(7) take any other action otherwise prohibited by the indenture to be taken without the consent of each holder affected by that action.

Defeasance and Discharge of Debt Securities and Certain Covenants in Certain Circumstances

The indenture permits us, at any time, to elect to discharge our obligations with respect to one or more series of debt securities by following certain procedures described in the indenture. These procedures would allow us either:

(1) to defease and be discharged from any and all of our obligations with respect to any debt securities except for the following obligations (which discharge is referred to as “legal defeasance”):

(a) to register the transfer or exchange of the debt securities;

(b) to replace temporary or mutilated, destroyed, lost or stolen debt securities;

(c) to compensate and indemnify the trustee; or

(d) to maintain an office or agency in respect of the debt securities and to hold monies for payment in trust; or

(2) to be released from our obligations with respect to the debt securities under certain covenants contained in the indenture, as well as any additional covenants which may be contained in the applicable prospectus supplement (which release is referred to as “covenant defeasance”).

In order to exercise either defeasance option, we must deposit with the trustee or other qualifying trustee, in trust for this purpose:

(1) money;

(2) U.S. Government Obligations (as described below) or Foreign Government Obligations (as described below) which through the scheduled payment of principal and interest in accordance with their terms will provide money; or

(3) a combination of money and/or U.S. Government Obligations and/or Foreign Government Obligations sufficient in the written opinion of a nationally-recognized firm of independent accountants to provide money;

which in each case specified in clauses (1) through (3) above, provides a sufficient amount to pay the principal of, premium, if any, and interest, if any, on the debt securities of a series, on the scheduled due dates or on a selected date of redemption in accordance with the terms of the indenture.

In addition, defeasance may be effected only if, among other things:

(1) in the case of either legal or covenant defeasance, we deliver to the trustee an opinion of counsel, as specified in the indenture, stating that as a result of the defeasance neither the trust nor the trustee will be required to register as an investment company under the Investment Company Act of 1940;

(2) in the case of legal defeasance, we deliver to the trustee an opinion of counsel stating that we have received from, or there has been published by, the Internal Revenue Service a ruling to the effect that, or there has been a change in any applicable federal income tax law with the effect that, and the opinion shall confirm that, the holders of outstanding debt securities will not recognize income, gain or loss for United States federal income tax purposes solely as a result of the legal defeasance and will be subject to United States federal income tax on the same amounts, in the same manner, including as a result of prepayment, and at the same times as would have been the case if a defeasance had not occurred;

14

[Table of Contents](#)

(3) in the case of covenant defeasance, we deliver to the trustee an opinion of counsel to the effect that the holders of the outstanding debt securities will not recognize income, gain or loss for United States federal income tax purposes as a result of the covenant defeasance and will be subject to United States federal income tax on the same amounts, in the same manner and at the same times as would have been the case if a covenant defeasance had not occurred; and

(4) certain other conditions described in the indenture are satisfied.

If we fail to comply with our remaining obligations under the indenture and applicable supplemental indenture after a covenant defeasance of the indenture and applicable supplemental indenture, and the debt securities are declared due and payable because of the occurrence of any undefeased event of default, the amount of money and/or U.S. Government Obligations and/or Foreign Government Obligations on deposit with the trustee could be insufficient to pay amounts due under the debt securities of that series at the time of acceleration. We would, however, remain liable in respect of these payments.

The term “U.S. Government Obligations” as used in the above discussion means securities which are direct obligations of or non-callable obligations guaranteed by the United States of America for the payment of which obligation or guarantee the full faith and credit of the United States of America is pledged.

The term “Foreign Government Obligations” as used in the above discussion means, with respect to debt securities of any series that are denominated in a currency other than U.S. dollars (1) direct obligations of the government that issued or caused to be issued the currency for the payment of which obligations its full faith and credit is pledged or (2) obligations of a person controlled or supervised by or acting as an agent or instrumentality of that government the timely payment of which is unconditionally guaranteed as a full faith and credit obligation by that government, which in either case under clauses (1) or (2), are not callable or redeemable at the option of the issuer.

Regarding the Trustee

We would identify the trustee with respect to any series of debt securities in the prospectus supplement relating to the debt securities. You should note that if the trustee becomes a creditor of Axcelis, the indenture and the Trust Indenture Act of 1939 limit the rights of the trustee to obtain payment of claims in certain cases, or to realize on certain property received in respect of certain claims, as security or otherwise. The trustee and its affiliates may engage in, and would be permitted to continue to engage in, other transactions with us and our affiliates. If, however, the trustee, acquires any “conflicting interest” within the meaning of the Trust Indenture Act of 1939, it must eliminate the conflict or resign.

The holders of a majority in principal amount of the then outstanding debt securities of any series may direct the time, method and place of conducting any proceeding for exercising any remedy available to the trustee. If an event of default occurs and is continuing, the trustee, in the exercise of its rights and powers, must use the degree of care and skill of a prudent person in the conduct of his or her own affairs. Subject to this provision, the trustee would be under no obligation to exercise any of its rights or powers under the indenture at the request of any of the holders of the debt securities, unless they have offered to the trustee reasonable indemnity or security.

15

DESCRIPTION OF WARRANTS

General

We may issue warrants to purchase debt securities (which we refer to as debt warrants), preferred stock (which we refer to as preferred stock warrants) or common stock (which we refer to as common stock warrants). Any of these warrants may be issued independently or together with any other securities offered by this prospectus and may be attached to or separate from the other securities. If warrants are issued, they would be issued under warrant agreements to be entered into between us and a bank or trust company, as warrant agent, all of which would be described in the prospectus supplement relating to the warrants being offered.

Debt Warrants

We would describe the terms of debt warrants offered in the applicable prospectus supplement, the warrant agreement relating to the debt warrants and the debt warrant certificates representing the debt warrants, including the following:

- (1) the title;
- (2) the aggregate number offered;
- (3) their issue price or prices;
- (4) the designation, aggregate principal amount and terms of the debt securities purchasable upon exercise, and the procedures and conditions relating to exercise;
- (5) the designation and terms of any related debt securities and the number of debt warrants issued with each security;
- (6) the date, if any, on and after which the debt warrants and the related debt securities will be separately transferable;
- (7) the principal amount of debt securities purchasable upon exercise, and the price at which that principal amount of debt securities may be purchased upon exercise;
- (8) the commencement and expiration dates of the right to exercise;
- (9) the maximum or minimum number which may be exercised at any time;
- (10) a discussion of the material United States federal income tax considerations applicable to exercise; and
- (11) any other terms, procedures and limitations relating to exercise.

Debt warrant certificates would be exchangeable for new debt warrant certificates of different denominations, and debt warrants may be exercised at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement. Before exercising their debt warrants, holders would not have any of the rights of holders of the securities purchasable upon exercise and would not be entitled to payments of principal of, or premium, if any, or interest, if any, on the securities purchasable upon exercise.

Other Warrants

The applicable prospectus supplement would describe, where applicable, the following terms and other information relating to the preferred stock warrants or common stock warrants offered under this prospectus:

- (1) the title;

[Table of Contents](#)

- (2) the securities issuable upon exercise;
- (3) the issue price or prices;
- (4) the number of warrants issued with each share of preferred stock or common stock;
- (5) any provisions for adjustment of (a) the number or amount of shares of preferred stock or common stock receivable upon exercise of the warrants or (b) the exercise price;
- (6) if applicable, the date on and after which the warrants and the related preferred stock or common stock will be separately transferable;
- (7) if applicable, a discussion of the material United States federal income tax considerations applicable to the exercise of the warrants;
- (8) any other terms, including terms, procedures and limitations relating to exchange and exercise;
- (9) the commencement and expiration dates of the right to exercise; and
- (10) the maximum or minimum number that may be exercised at any time.

Exercise of Warrants

Each warrant would entitle the holder to purchase for cash the principal amount of debt securities or shares of preferred stock or common stock at the applicable exercise price set forth in, or determined as described in, the applicable prospectus supplement. Warrants may be exercised at any time up to the close of business on the expiration date set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants would become void.

Warrants may be exercised by delivering to the corporation trust office of the warrant agent or any other officer indicated in the applicable prospectus supplement (a) the warrant certificate properly completed and duly executed and (b) payment of the amount due upon exercise. As soon as practicable following exercise, we would forward the debt securities or shares of preferred stock or common stock purchasable upon exercise. If less than all of the warrants represented by a warrant certificate are exercised, a new warrant certificate would be issued for the remaining warrants.

[Table of Contents](#)

DESCRIPTION OF UNITS

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the units that we may offer under this prospectus. Units may be offered independently or together with common stock, preferred stock, debt securities and/or warrants offered by any prospectus supplement, and may be attached to or separate from those securities. While the terms we have summarized below would apply generally to any units that we may offer under this prospectus, we would describe the particular terms of any series of units in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement would fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We would issue the units under a unit agreement between us and a unit agent to be specified therein, if any. We use the term “unit agreement” to refer to any of these unit agreements.

We would file as exhibits to the registration statement of which this prospectus is a part, or would incorporate by reference from a current report on Form 8-K that we file with the SEC, the form of unit agreement that describes the terms of the series of units we are offering, and any supplemental agreements, before the issuance of the related series of units. The following summaries of material terms and provisions of the units are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement and any supplemental agreements applicable to a particular series of units. We urge you to read the applicable prospectus supplements related to the particular series of units that we sell under this prospectus, as well as the complete unit agreement and any supplemental agreements that contain the terms of the units.

General

We may issue units comprised of one or more debt securities, shares of common stock, shares of preferred stock and warrants in any combination. Each unit would be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit would have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

We would describe in the applicable prospectus supplement the terms of the series of units, including:

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any provisions of the governing unit agreement that differ from those described below; and
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units.

The provisions described in this section, as well as those described under “Description of Capital Stock,” “Description of Debt Securities” and “Description of Warrants” would apply to each unit and to any common stock, preferred stock, debt security or warrant included in each unit, respectively.

Issuance in Series

We may issue units in such amounts and in numerous distinct series as we determine.

Enforceability of Rights by Holders of Units

Each unit agent would act solely as our agent under the applicable unit agreement and would not assume any obligation or relationship of agency or trust with any holder of any unit. A single bank or trust company may act as unit agent for more than one series of units. A unit agent would have no duty or responsibility in case of any default

[Table of Contents](#)

by us under the applicable unit agreement or unit, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a unit may, without the consent of the related unit agent or the holder of any other unit, enforce by appropriate legal action its rights as holder under any security included in the unit.

Title

[Table of Contents](#)

PLAN OF DISTRIBUTION

We may sell the securities being offered by us in this prospectus:

- (1) directly to purchasers;
- (2) through agents;
- (3) through dealers;
- (4) through underwriters; or
- (5) through a combination of any of these methods of sale.

We and our agents and underwriters may sell the securities being offered by us in this prospectus from time to time in one or more transactions:

- (1) at a fixed price or prices, which may be changed;
- (2) at market prices prevailing at the time of sale;
- (3) at prices related to the prevailing market prices; or
- (4) at negotiated prices.

Direct Sales Through Agents

We may solicit directly offers to purchase securities. We may also designate agents from time to time to solicit offers to purchase securities. Any agent, who may be deemed to be an “underwriter” as that term is defined in the Securities Act of 1933, may then resell the securities to the public at varying prices to be determined by that agent at the time of resale.

Sales Through Underwriters or Dealers

If we use underwriters to sell securities, we would enter into an underwriting agreement with them at the time of the sale to them. The names of the underwriters would be set forth in the prospectus supplement that would be used by them together with this prospectus to make resales of the securities to the public. In connection with the sale of the securities offered, these underwriters may be deemed to have received compensation from us in the form of underwriting discounts or commissions. Underwriters may also receive commissions from purchasers of the securities.

Underwriters may also use dealers to sell securities. If this happens, these dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for whom they may act as agents.

Any underwriting compensation paid by us to underwriters in connection with the offering of the securities offered in this prospectus, and any discounts, concessions or commissions allowed by underwriters to participating dealers, would be set forth in the applicable prospectus supplement. In no event would the total amount of compensation paid to any member of The Financial Industry Regulatory Authority (FINRA) upon completion of any offering exceed 8.0% of the maximum gross proceeds of such offering.

Underwriters, dealers, agents and other persons may be entitled, under agreements that may be entered into with us, to indemnification by us against certain civil liabilities, including liabilities under the Securities Act of 1933, or to contribution with respect to payments that they may be required to make in respect of these liabilities.

[Table of Contents](#)

Underwriters and agents may engage in transactions with, or perform services for, us in the ordinary course of business.

If so indicated in the applicable prospectus supplement, we would authorize underwriters, dealers, or other persons to solicit offers by certain institutions to purchase the securities offered by us under this prospectus pursuant to contracts providing for payment and delivery on a future date or dates. The obligations of any purchaser under any of these contracts would be subject only to those conditions described in the applicable prospectus supplement, and the prospectus supplement would set forth the price to be paid for securities pursuant to these contracts and the commissions payable for solicitation of these contracts.

Any underwriter may engage in over-allotment, stabilizing and syndicate short covering transactions and penalty bids only in compliance with Regulation M of the Securities Exchange Act of 1934. If we offer securities in an “at the market” offering, stabilizing transactions would not be permitted. Over-allotment involves sales in excess of the offering size, which creates a short position. Stabilizing transactions involve bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Syndicate short covering transactions involve purchases of securities in the open market after the distribution has been completed in order to cover syndicate short positions. Penalty bids permit the underwriters to reclaim selling

concessions from dealers when the securities originally sold by the dealers are purchased in covering transactions to cover syndicate short positions. These transactions may cause the price of the securities sold in an offering to be higher than it would otherwise be. These transactions, if commenced, may be discontinued by the underwriters at any time.

Rights Offerings

We may offer rights to our existing stockholders to purchase additional common shares of ours. For any particular subscription rights, the applicable prospectus supplement would describe the terms of such rights, including the period during which such rights may be exercised, the manner of exercising such rights, the transferability of such rights and the number of common shares that may be purchased in connection with each right and the subscription price for the purchase of such common shares. In connection with a rights offering, we may enter into a separate agreement with one or more underwriters or standby purchasers to purchase any of our common shares not subscribed for in the rights offering by existing stockholders, which would be described in the applicable prospectus supplement.

General Information

Each series of securities offered under this prospectus would be a new issue with no established trading market, other than the common stock, which is listed on The Nasdaq Global Select Market. Any shares of common stock sold pursuant to a prospectus supplement would be listed on The Nasdaq Global Select Market, subject to official notice of issuance. Any underwriters to whom we sell securities for public offering and sale may make a market in the securities, but these underwriters would not be obligated to do so and may discontinue any market making at any time without notice. We may elect to list any of the securities we may offer from time to time for trading on an exchange or on The Nasdaq Global Select Market, but we are not obligated to do so.

The anticipated date of delivery of the securities offered hereby would be set forth in the applicable prospectus supplement relating to each offering.

LEGAL MATTERS

The validity of the securities offered hereby will be passed upon by Locke Lord LLP, Boston, Massachusetts, our counsel. The validity of any securities will be passed upon for any underwriters or agents by counsel that we will name in the applicable prospectus supplement.

21

[Table of Contents](#)

EXPERTS

The consolidated financial statements of Axcelis Technologies, Inc. appearing in Axcelis Technologies, Inc.'s Annual Report (Form 10-K) for the year ended December 31, 2016 (including the schedule appearing therein), and the effectiveness of Axcelis Technologies, Inc.'s internal control over financial reporting as of December 31, 2016 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and special reports, proxy statements and other information with the SEC. Our internet website is www.axcelis.com and through the Investors section of our website, you may access, free of charge, our filings, as soon as reasonably practicable after we electronically file such materials with, or furnish them to, the SEC. The information contained in our website is not incorporated by reference into this prospectus and does not constitute a part of this prospectus. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Copies of all or a portion of such materials can be obtained from the Public Reference Section of the SEC upon payment of prescribed fees. Please call the SEC at 1-800-SEC-0330 for further information. Our SEC filings are also available to the public at the SEC's web site at <http://www.sec.gov>. Our common stock is listed on The NASDAQ Global Select Market. Reports and other information concerning us can be inspected at the offices of The NASDAQ Global Select Market.

22

[Table of Contents](#)

INCORPORATION BY REFERENCE

The SEC allows us to "incorporate by reference" the information we have filed with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is deemed to be a part of this prospectus. The reports and other documents we file after the date of this prospectus will update, supplement and supersede the information in this prospectus. We incorporate by reference the documents listed below and any documents we file later with the SEC under Section 13(a), 13(c), 14, or 15(d) of the Exchange Act after the date of the initial registration statement and before the effectiveness of the registration statement and after the date of the prospectus and before the termination of the offering; *provided, however*, that we are not incorporating any information furnished under Item 2.02 or Item 7.01 of any Current Report on Form 8-K.

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, filed with the SEC on March 14, 2017;
- our Current Report on Form 8-K filed with the SEC on February 21, 2017;
- The description of the common stock contained in our Amended and Restated Certificate of Incorporation filed with our Registration Statement on Form S-1 (Registration No. 333-36330), including any further amendment or report filed hereafter for the purpose of updating such description.

We will provide without charge to each person, including any beneficial owner to whom this prospectus is delivered, upon written or oral request, a copy of any document incorporated by reference in this prospectus. Requests for such documents should be directed to:

[Table of Contents](#)

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The expenses in connection with the securities being registered are as follows:

| | | |
|--|----|---------|
| SEC registration fee | \$ | 8,693 |
| Accounting fees and expenses | \$ | 100,000 |
| Legal fees and expenses | \$ | 100,000 |
| Printing and photocopying expenses | \$ | 8,000 |
| Miscellaneous expenses (including any applicable listing fees, rating agency fees, trustee and transfer agent fees and expenses) | \$ | 20,307 |
| TOTAL | \$ | 237,000 |

All of the above figures, except the SEC registration fee, are estimates.

Item 15. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law (DGCL) allows us to indemnify our directors, officers, employees and agents against actual and reasonable expenses they incur in connection with any action, suit or proceeding brought against them because they are a director, officer, employee or agent. Under Delaware law, we may pay all these expenses, provided that: (1) the person in question acted in good faith and in a manner reasonably believed to be not opposed to our best interests; and (2) in the case of a criminal proceeding, the person had no reasonable cause to believe the conduct in question was unlawful. We shall make no indemnification in connection with any proceeding brought on our behalf where the person involved is adjudged to be liable to us, except as may be ordered by a court.

Article THIRD of our Amended and Restated Certificate of Incorporation provides that we shall, to the fullest extent permitted by Section 145 of the DGCL, indemnify any person who was or is made or is threatened to be made a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal, administrative or investigative by reason of the fact that such person, or a person for whom he or she is the legal representative, is or was a director, officer, employee or agent of Axcelis or is or was serving at the request of Axcelis as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, enterprise or non-profit entity against all liability and loss suffered and expenses reasonably incurred by such person. Such right shall not be exclusive of any other rights to which those seeking indemnification may otherwise be entitled.

Article THIRD further provides that no director shall be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duty by a director as a director except for liability (i) for any breach of the director's duty of loyalty to Axcelis or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) pursuant to Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit.

Article THIRD further states that if the DGCL is amended to allow further limitation of the liability of our directors or officers, then the liability of those directors or officers shall be limited to the fullest extent permitted by the DGCL, as from time to time amended.

We carry insurance that covers our directors and officers against some liabilities they may incur when acting in their official capacities.

Item 16. Exhibits

See the Exhibit Index immediately following the signature page hereto.

II-1

[Table of Contents](#)

Item 17. Undertakings

(a) The undersigned registrant hereby undertakes as follows:

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

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

(ii) To reflect in the prospectus any facts or events arising after the effective date of this Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this Registration Statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the

changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

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

Provided, however, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the registration statement is on Form S-3, Form S-8 or Form F-3, and the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in this Registration Statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of this Registration Statement.

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

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

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

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

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering

II-2

[Table of Contents](#)

thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities: The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

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

(c) The undersigned registrant hereby undertakes to supplement the prospectus, after the expiration of the subscription period, to set forth the results of the subscription offer, the transactions by the underwriters during the subscription period, the amount of unsubscribed securities to be purchased by the underwriters, and the terms of any subsequent reoffering thereof. If any public offering by the underwriters is to be made on terms differing from those set forth on the cover page of the prospectus, a post-effective amendment will be filed to set forth the terms of such offering.

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

appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(e) The undersigned hereby undertakes to file an application for the purpose of determining the eligibility of the trustee to act under subsection (a) of Section 310 of the Trust Indenture Act (the "Act") in accordance with the rules and regulations prescribed by the Securities and Exchange Commission under Section 305(b)(2) of the Act.

II-3

[Table of Contents](#)

SIGNATURES

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

AXCELIS TECHNOLOGIES, INC.

By: /s/ Mary G. Puma
Mary G. Puma
Chief Executive Officer and President

POWER OF ATTORNEY

We, the undersigned officers and directors of Axcelis Technologies, Inc., hereby severally constitute and appoint Mary G. Puma, Kevin J. Brewer and Lynnette C. Fallon, and each of them singly, our true and lawful attorneys-in-fact and agents, with full power of substitution to them in any and all capacities, to sign and file any and all amendments to this registration statement on Form S-3 (including pre- and post-effective amendments), and any related Rule 462 registration statement or amendment thereto, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact may do or cause to be done by virtue hereof.

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

| <u>Signature</u> | <u>Title</u> | <u>Date</u> |
|---|---|---------------|
| <u>/s/ Mary G. Puma</u> Mary G. Puma | Chief Executive Officer and President (principal executive officer) and Director | April 7, 2017 |
| <u>/s/ Kevin J. Brewer</u> Kevin J. Brewer | Executive Vice President and Chief Financial Officer (principal accounting and financial officer) | April 7, 2017 |
| <u>/s/ Richard J. Faubert</u> Richard J. Faubert | Director | April 7, 2017 |
| <u>/s/ R. John Fletcher</u> R. John Fletcher | Director | April 7, 2017 |

[Table of Contents](#)

| | | |
|---|----------|---------------|
| <u>/s/ Arthur L. George, Jr.</u> Arthur L. George, Jr. | Director | April 7, 2017 |
| <u>/s/ Joseph P. Keithley</u> Joseph P. Keithley | Director | April 7, 2017 |
| <u>/s/ John T. Kurtzweil</u> John T. Kurtzweil | Director | April 7, 2017 |
| <u>/s/ Patrick H. Nettles</u> Patrick H. Nettles | Director | April 7, 2017 |
| <u>/s/ Thomas St. Dennis</u> Thomas St. Dennis | Director | April 7, 2017 |

[Table of Contents](#)

EXHIBIT INDEX

| <u>Exhibit Number</u> | <u>Description</u> |
|-----------------------|---|
| 1.1* | Form of Underwriting Agreement. |
| 4.1 | Form of Indenture. |
| 4.2* | Specimen Preferred Stock Certificate and Form of Certificate of Designation of Preferred Stock. |
| 4.3* | Form of Note. |
| 4.4* | Form of Warrant. |
| 4.5* | Form of Warrant Agreement. |
| 4.6* | Form of Subscription Agreement for Rights Offering. |
| 4.7* | Form of Unit Agreement. |
| 5.1 | Opinion of Locke Lord LLP. |
| 12.1 | Computation of Ratio of Earnings to Fixed Charges. |
| 23.1 | Consent of Ernst & Young LLP, an independent registered public accounting firm. |
| 23.2 | Consent of Locke Lord LLP (contained in Opinion of Locke Lord LLP filed as Exhibit 5.1). |
| 25.1* | Statement of Eligibility of Trustee under the Indenture on Form T-1. To be filed separately pursuant to Section 305(b)(2) of the Trust Indenture Act of 1939. |

*To be filed by amendment or as an exhibit to a Current Report of the Registrant on Form 8-K and incorporated by reference herein, if applicable.

Axcelis Technologies, Inc.

and

[], as Trustee

INDENTURE

Dated as of [,]

TABLE OF CONTENTS

| | | Page |
|-----------|--|-------------|
| ARTICLE 1 | DEFINITIONS AND INCORPORATION BY REFERENCE | 1 |
| 1.1 | Definitions | 1 |
| 1.2 | Other Definitions | 5 |
| 1.3 | Incorporation by Reference of Trust Indenture Act | 5 |
| 1.4 | Rules of Construction | 6 |
| ARTICLE 2 | THE SECURITIES | 6 |
| 2.1 | Issuable in Series | 6 |
| 2.2 | Establishment of Terms of Series of Securities | 7 |
| 2.3 | Execution and Authentication | 9 |
| 2.4 | Registrar and Paying Agent | 10 |
| 2.5 | Paying Agent To Hold Assets in Trust | 11 |
| 2.6 | Securityholder Lists | 11 |
| 2.7 | Transfer and Exchange | 11 |
| 2.8 | Replacement Securities | 12 |
| 2.9 | Outstanding Securities | 12 |
| 2.10 | Treasury Securities | 13 |
| 2.11 | Temporary Securities | 13 |
| 2.12 | Cancellation | 13 |
| 2.13 | Payment of Interest; Defaulted Interest; Computation of Interest | 13 |
| 2.14 | CUSIP Number | 14 |
| 2.15 | Provisions for Global Securities | 14 |
| 2.16 | Persons Deemed Owners | 16 |
| ARTICLE 3 | REDEMPTION | 16 |
| 3.1 | Notices of Trustee | 16 |
| 3.2 | Selection by Trustee of Securities to Be Redeemed | 16 |
| 3.3 | Notice of Redemption | 17 |
| 3.4 | Effect of Notice of Redemption | 18 |

| | | |
|-----------|---|----|
| 3.5 | Deposit of Redemption Price | 18 |
| 3.6 | Securities Redeemed in Part | 18 |
| ARTICLE 4 | COVENANTS | 18 |
| 4.1 | Payment of Securities | 18 |
| 4.2 | SEC Reports | 19 |
| 4.3 | Waiver of Stay, Extension or Usury Laws | 19 |

TABLE OF CONTENTS

| | | <u>Page</u> |
|-----------|--|-------------|
| 4.4 | Compliance Certificate | 19 |
| 4.5 | Payment of Taxes and Other Claims | 20 |
| 4.6 | Corporate Existence | 20 |
| 4.7 | Maintenance of Properties | 20 |
| ARTICLE 5 | SUCCESSOR CORPORATION | 21 |
| 5.1 | Limitation on Consolidation, Merger and Sale of Assets | 21 |
| 5.2 | Successor Person Substituted | 22 |
| ARTICLE 6 | DEFAULTS AND REMEDIES | 22 |
| 6.1 | Events of Default | 22 |
| 6.2 | Acceleration | 23 |
| 6.3 | Other Remedies | 24 |
| 6.4 | Waiver of Past Defaults and Events of Default | 24 |
| 6.5 | Control by Majority | 24 |
| 6.6 | Limitation on Suits | 24 |
| 6.7 | Rights of Holders To Receive Payment | 25 |
| 6.8 | Collection Suit by Trustee | 25 |
| 6.9 | Trustee May File Proofs of Claim | 25 |
| 6.10 | Priorities | 26 |
| 6.11 | Undertaking for Costs | 26 |
| ARTICLE 7 | TRUSTEE | 26 |
| 7.1 | Duties of Trustee | 26 |
| 7.2 | Rights of Trustee | 28 |
| 7.3 | Individual Rights of Trustee | 28 |
| 7.4 | Trustee's Disclaimer | 29 |
| 7.5 | Notice of Default | 29 |
| 7.6 | Reports by Trustee to Holders | 29 |
| 7.7 | Compensation and Indemnity | 29 |
| 7.8 | Replacement of Trustee | 30 |

| | | |
|-----------|--|----|
| 7.9 | Successor Trustee by Consolidation, Merger or Conversion | 31 |
| 7.10 | Eligibility; Disqualification | 31 |
| 7.11 | Preferential Collection of Claims Against Company | 31 |
| 7.12 | Paying Agents | 31 |
| ARTICLE 8 | AMENDMENTS, SUPPLEMENTS AND WAIVERS | 32 |

TABLE OF CONTENTS

| | <u>Page</u> | |
|------------|---|----|
| 8.1 | Without Consent of Holders | 32 |
| 8.2 | With Consent of Holders | 32 |
| 8.3 | Compliance with Trust Indenture Act | 34 |
| 8.4 | Revocation and Effect of Consents | 34 |
| 8.5 | Notation on or Exchange of Securities | 35 |
| 8.6 | Trustee to Sign Amendments, Etc. | 35 |
| ARTICLE 9 | DISCHARGE OF INDENTURE; DEFEASANCE | 35 |
| 9.1 | Discharge of Indenture | 35 |
| 9.2 | Legal Defeasance | 35 |
| 9.3 | Covenant Defeasance | 36 |
| 9.4 | Conditions to Legal Defeasance or Covenant Defeasance | 36 |
| 9.5 | Deposited Money and U.S. and Foreign Government Obligations to be Held in Trust; Other Miscellaneous Provisions | 38 |
| 9.6 | Reinstatement | 38 |
| 9.7 | Moneys Held by Paying Agent | 39 |
| 9.8 | Moneys Held by Trustee | 39 |
| ARTICLE 10 | MISCELLANEOUS | 39 |
| 10.1 | Trust Indenture Act Controls | 39 |
| 10.2 | Notices | 40 |
| 10.3 | Communications by Holders with Other Holders | 41 |
| 10.4 | Certificate and Opinion as to Conditions Precedent | 41 |
| 10.5 | Statement Required in Certificate and Opinion | 41 |
| 10.6 | Rules by Trustee and Agents | 41 |
| 10.7 | Business Days; Legal Holidays | 42 |
| 10.8 | Governing Law | 42 |
| 10.9 | No Adverse Interpretation of Other Agreements | 42 |
| 10.10 | No Recourse Against Others | 42 |
| 10.11 | Successors and Assigns | 42 |
| 10.12 | Multiple Counterparts | 42 |
| 10.13 | Table of Contents, Headings, Etc. | 43 |

| | | |
|-------|---|----|
| 10.14 | Separability | 43 |
| 10.15 | Securities in a Foreign Currency or in Euro | 43 |
| 10.16 | Judgment Currency | 44 |

CROSS-REFERENCE TABLE

| TIA SECTION | INDENTURE SECTION |
|-----------------------|-------------------|
| 310(a)(1) | 7.10 |
| (a)(2) | 7.10 |
| (a)(3) | N/A |
| (a)(4) | N/A |
| (a)(5) | 7.10 |
| (b) | 7.8; 7.10; 10.2 |
| (b)(1) | 7.10 |
| (b)(9) | 7.10 |
| (c) | N/A |
| 311(a) | 7.11 |
| (b) | 7.11 |
| (c) | N/A |
| 312(a) | 2.6 |
| (b) | 10.3 |
| (c) | 10.3 |
| 313(a) | 7.6 |
| (b)(1) | 7.6 |
| (b)(2) | 7.6 |
| (c) | 7.6; 10.2 |
| (d) | 7.6 |
| 314(a) | 4.2; 4.4; 10.2 |
| (b) | N/A |
| (c)(1) | 10.4; 10.5 |
| (c)(2) | 10.4; 10.5 |
| (c)(3) | N/A |
| (d) | N/A |
| (e) | 10.5 |
| (f) | N/A |
| 315(a) | 7.1, 7.2 |
| (b) | 7.5; 10.2 |
| (c) | 7.1 |
| (d) | 6.5; 7.1; 7.2 |
| (e) | 6.11 |
| 316(a)(last sentence) | 2.10 |
| (a)(1)(A) | 6.5 |
| (a)(1)(B) | 6.4 |
| (a)(2) | 8.2 |
| (b) | 6.7 |
| (c) | 8.4 |
| 317(a)(1) | 6.8 |

| | |
|--------|-----------|
| (a)(2) | 6.9 |
| (b) | 2.5; 7.12 |
| 318(a) | 10.1 |

N/A means not applicable

Note: This Cross-Reference Table shall not, for any purpose, be deemed to be a part of the Indenture.

INDENTURE, dated as of [], [], by and between Axcelis Technologies, Inc., a Delaware corporation, as Issuer (the "Company"), and [], a [] organized under the laws of [], as Trustee (the "Trustee").

The Company has duly authorized the execution and delivery of this Indenture to provide for the issuance from time to time of its debentures, notes or other evidences of indebtedness to be issued in one or more series (the “*Securities*”), as herein provided, up to such principal amount as may from time to time be authorized in or pursuant to one or more resolutions of the Board of Directors or by supplemental indenture.

All things necessary to make this Indenture a valid agreement of the Company in accordance with its terms have been done, and the execution and delivery thereof have been in all respects duly authorized by the parties hereto.

NOW, THEREFORE, THIS INDENTURE WITNESSETH:

Each party agrees as follows for the benefit of the other parties and for the equal and ratable benefit of the Holders of the Securities issued under this Indenture:

ARTICLE 1

DEFINITIONS AND INCORPORATION BY REFERENCE

1.1 Definitions.

“*Affiliate*” of any specified Person means any other Person which directly or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with, such specified Person. For the purposes of this definition, “control” (including, with correlative meanings, the terms “controlling,” “controlled by,” and “under common control with”), as used with respect to any Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of such Person, whether through the ownership of voting securities, by agreement or otherwise.

“*Agent*” means any Registrar, Paying Agent, co-registrar or agent for service of notices and demands.

“*Bankruptcy Law*” means Title 11, U.S. Code or any similar Federal or state law for the relief of debtors.

“*Board of Directors*” means the Board of Directors of the Company or any committee authorized to act therefor.

“*Board Resolution*” means a copy of a resolution certified pursuant to an Officers’ Certificate to have been duly adopted by the Board of Directors of the Company and to be in full force and effect on the date of such certification, and delivered to the Trustee.

“*Business Day*” is a day other than a Saturday, a Sunday, a federally recognized holiday or a day on which banking institutions are not required to be open in the State of New York.

“*Capital Stock*” means, with respect to any Person, any and all shares or other equivalents (however designated) of capital stock, partnership interests or any other participation, right or other interest in the nature of an equity interest in such Person or any option, warrant or other security convertible into any of the foregoing.

“*Company*” means the party named as such in the first paragraph of this Indenture until a successor replaces such party pursuant to Article 5 of this Indenture, and thereafter means the successor and any other primary obligor on the Securities.

“*Company Order*” means a written order signed in the name of the Company by two Officers, one of whom must be its Chief Executive Officer or its Chief Financial Officer.

“*Company Request*” means any written request signed in the name of the Company by its Chief Executive Officer, its President, any Vice President, its Chief Financial Officer or its Treasurer and attested to by the Secretary or any Assistant Secretary of the Company.

“*Corporate Trust Office*” means the office of the Trustee at which at any particular time its corporate trust business shall be principally administered.

“*Custodian*” means any receiver, trustee, assignee, liquidator or similar official under any Bankruptcy Law.

“*Default*” means any event that is, or with the passing of time or giving of notice or both would be, an Event of Default.

“*Depository*” means, with respect to the Securities of any Series issuable or issued in whole or in part in the form of one or more Global Securities, the Person designated as Depository for such Series by the Company, which Depository shall be a clearing agency registered under the Exchange Act, until a successor Depository shall have become such pursuant to the applicable provisions of this Indenture, and thereafter “*Depository*” shall mean each Person who is then a Depository hereunder, and if at any time there is more than one such Person, such Persons.

“*Dollars*” means the currency of the United States of America.

“*Euro*” means the single currency of participating member states of the economic and monetary union as contemplated in the Treaty on European Union.

“*Exchange Act*” means the Securities Exchange Act of 1934, as amended.

“*Foreign Currency*” means any currency or currency unit issued by a government other than the government of the United States of America.

“*Foreign Government Obligations*” means with respect to Securities of any Series that are denominated in a Foreign Currency, (i) direct obligations of the government that issued or

caused to be issued such currency for the payment of which obligations its full faith and credit is pledged or (ii) obligations of a person controlled or supervised by or acting as an agency or instrumentality of such government the timely payment of which is unconditionally guaranteed as a full faith and credit obligation by such government, which, in either case under clauses (i) or (ii), are not callable or redeemable at the option of the issuer thereof.

“GAAP” means generally accepted accounting principles consistently applied as in effect in the United States from time to time.

“Global Security” or “Global Securities” means a Security or Securities, as the case may be, in the form established pursuant to Section 2.2, evidencing all or part of a Series of Securities issued to the Depository for such Series or its nominee, registered in the name of such Depository or nominee, and bearing the legend set forth in Section 2.15(c) (or such legend as may be specified as contemplated by Section 2.2 for such Securities).

“Holder” or “Securityholder” means the Person in whose name a Security is registered on the Registrar’s books.

“Indebtedness” means (without duplication), with respect to any Person, any indebtedness at any time outstanding, secured or unsecured, contingent or otherwise, which is for borrowed money (whether or not the recourse of the lender is to the whole of the assets of such Person or only to a portion thereof), or evidenced by bonds, notes, debentures or similar instruments or representing the balance deferred and unpaid of the purchase price of any property (excluding any balances that constitute accounts payable or trade payables, and other accrued liabilities arising in the ordinary course of business) if and to the extent any of the foregoing indebtedness would appear as a liability upon a balance sheet of such Person prepared in accordance with GAAP.

“Indenture” means this Indenture as amended, restated or supplemented from time to time.

“Interest Payment Date” means the Stated Maturity of an installment of interest on Securities of any Series.

“Lien” means, with respect to any property or assets of any Person, any mortgage or deed of trust, pledge, hypothecation, assignment, deposit arrangement, security interest, lien, charge, easement, encumbrance, preference, priority, or other security agreement or preferential arrangement of any kind or nature whatsoever on or with respect to such property or assets (including, without limitation, any capitalized lease obligation, conditional sales, or other title retention agreement having substantially the same economic effect as any of the foregoing).

“Maturity Date” when used with respect to any Security or installment of principal thereof, means the date on which the principal of such Security or such installment of principal becomes due and payable as therein or herein provided, whether at the Stated Maturity or by declaration of acceleration, call for redemption, notice of option to elect payment or otherwise.

“Officer” means the Chief Executive Officer, the President, any Vice President, the Chief Financial Officer, the Treasurer or the Secretary of the Company or any other officer designated by the Board of Directors, as the case may be.

“Officers’ Certificate” means, with respect to any Person, a certificate signed by the Chief Executive Officer, the President or any Vice President, and the Chief Financial Officer or any Treasurer of such Person that shall comply with applicable provisions of this Indenture.

“Opinion of Counsel” means a written opinion from legal counsel which counsel is reasonably acceptable to the Trustee.

“Person” means any individual, corporation, limited liability company, partnership, joint venture, association, joint-stock company, trust, unincorporated organization or government (including any agency or political subdivision thereof).

“Redemption Date” when used with respect to any Security of a Series to be redeemed, means the date fixed for such redemption pursuant to this Indenture.

“Responsible Officer” when used with respect to the Trustee, means any officer or officers within the corporate trust department of the Trustee (or any successor group of the Trustee) or any other officer of the Trustee customarily performing functions similar to those performed by any of the above designated officers and who are responsible for compliance with the obligations of the Trustee as set forth in this Indenture and also means, with respect to a particular corporate trust matter or obligation required of the Trustee as set forth in this Indenture, any other officer to whom such matter is referred because of his knowledge of and familiarity with the particular subject.

“SEC” means the United States Securities and Exchange Commission as constituted from time to time or any successor performing substantially the same functions.

“Securities” means the securities that are issued under this Indenture, as amended or supplemented from time to time pursuant to this Indenture.

“Securities Act” means the Securities Act of 1933, as amended.

“Series” or “Series of Securities” means each series of debentures, notes or other debt instruments of the Company created pursuant to Sections 2.1 or 2.2 hereof.

“Significant Subsidiary” means (i) any direct or indirect Subsidiary of the Company that would be a “significant subsidiary” as defined in Article 1, Rule 1-02 of Regulation S-X, promulgated pursuant to the Securities Act, as such regulation is in effect on the date hereof, or (ii) any group of direct or indirect Subsidiaries of the Company that, taken together as a group, would be a “significant subsidiary” as defined in Article 1, Rule 1-02 of Regulation S-X, promulgated pursuant to the Securities Act, as such regulation is in effect on the date hereof.

“Stated Maturity” means, when used with respect to any Security of any Series or any installment of principal thereof or interest thereon, means the date specified in such Security as the fixed date on which the principal of such Security or such installment of principal or interest

is due and payable and, when used with respect to any other Indebtedness, means the date specified in the instrument governing such Indebtedness as the fixed date on which the principal of such Indebtedness, or any installment of interest thereon, is due and payable.

“*Subsidiary*” of any specified Person means any corporation, limited liability company, partnership, joint venture, association or other business entity, whether now existing or hereafter organized or acquired, (i) in the case of a corporation, of which more than 50% of the total voting power of the Capital Stock entitled (without regard to the occurrence of any contingency) to vote in the election of directors thereof is held, directly or indirectly by such Person or any of its Subsidiaries; or (ii) in the case of a partnership, joint venture, association or other business entity, with respect to which such Person or any of its Subsidiaries has the power to direct or cause the direction of the management and policies of such entity by contract or otherwise or if in accordance with GAAP such entity is consolidated with such Person for financial statement purposes.

“*TIA*” means the Trust Indenture Act of 1939 (15 U.S. Code Section 77aaa-77bbbb) as in effect on the date of this Indenture (except as provided in Section 8.3 hereof).

“*Trustee*” means the party named as such in this Indenture until a successor replaces it pursuant to this Indenture and thereafter means the successor.

“*U.S. Government Obligations*” means direct non-callable obligations of, or non-callable obligations guaranteed by, the United States of America for the payment of which obligation or guarantee the full faith and credit of the United States of America is pledged.

1.2 Other Definitions.

The definitions of the following terms may be found in the sections indicated as follows:

| Term | Defined in Section |
|---------------------------------|--------------------|
| “ <i>Covenant Defeasance</i> ” | 9.3 |
| “ <i>Event of Default</i> ” | 6.1 |
| “ <i>Journal</i> ” | 10.16 |
| “ <i>Judgment Currency</i> ” | 10.17 |
| “ <i>Legal Defeasance</i> ” | 9.2 |
| “ <i>Market Exchange Rate</i> ” | 10.16 |
| “ <i>New York Banking Day</i> ” | 10.17 |
| “ <i>Paying Agent</i> ” | 2.4 |
| “ <i>Registrar</i> ” | 2.4 |
| “ <i>Required Currency</i> ” | 10.17 |
| “ <i>Service Agent</i> ” | 2.4 |

1.3 Incorporation by Reference of Trust Indenture Act.

Whenever this Indenture refers to a provision of the TIA, the portion of such provision required to be incorporated herein in order for this Indenture to be qualified under the TIA is

incorporated by reference in and made a part of this Indenture. The following TIA terms used in this Indenture have the following meanings:

“*Commission*” means the SEC.

“*indenture securities*” means the Securities.

“*indenture securityholder*” means a Securityholder.

“*indenture to be qualified*” means this Indenture.

“*indenture trustee*” or “*institutional trustee*” means the Trustee.

“*obligor on the indenture securities*” means the Company or any other obligor on the Securities.

All other terms used in this Indenture that are defined by the TIA, defined in the TIA by reference to another statute or defined by SEC rule have the meanings therein assigned to them.

1.4 Rules of Construction.

Unless the context otherwise requires:

- (1) a term has the meaning assigned to it herein, whether defined expressly or by reference;
- (2) an accounting term not otherwise defined has the meaning assigned to it in accordance with GAAP;
- (3) “*or*” is not exclusive;

- (4) words in the singular include the plural, and in the plural include the singular;
- (5) words used herein implying any gender shall apply to each gender; and
- (6) the words “herein”, “hereof” and “hereunder” and other words of similar import refer to this Indenture as a whole and not to any particular Article, Section or other sub-division.

ARTICLE 2

THE SECURITIES

2.1 Issuable in Series.

The aggregate principal amount of Securities that may be authenticated and delivered under this Indenture is unlimited. The Securities may be issued in one or more Series. All Securities of a Series shall be identical except as may be set forth in a Board Resolution, a

6

supplemental indenture or an Officers’ Certificate detailing the adoption of the terms thereof pursuant to the authority granted under a Board Resolution. In the case of Securities of a Series to be issued from time to time, the Board Resolution, Officers’ Certificate or supplemental indenture may provide for the method by which specified terms (such as interest rate, Stated Maturity, record date or date from which interest shall accrue) are to be determined. Securities may differ between Series in respect of any matters, provided that all Series of Securities shall be equally and ratably entitled to the benefits of the Indenture.

2.2 Establishment of Terms of Series of Securities.

At or prior to the issuance of any Securities within a Series, the following shall be established (as to the Series generally, in the case of Subsection 2.2(1) and either as to such Securities within the Series or as to the Series generally in the case of Subsections 2.2(2) through 2.2(25)) by a Board Resolution, a supplemental indenture or an Officers’ Certificate, in each case, pursuant to authority granted under a Board Resolution:

- (1) the title of the Series (which shall distinguish the Securities of that particular Series from the Securities of any other Series);
- (2) the price or prices (expressed as a percentage of the principal amount thereof) at which the Securities of the Series will be issued;
- (3) any limit upon the aggregate principal amount of the Securities of the Series which may be authenticated and delivered under this Indenture (except for Securities authenticated and delivered upon registration of transfer of, or in exchange for, or in lieu of, other Securities of the Series pursuant to Section 2.7, 2.8, 2.11, 3.6 or 8.5);
- (4) the date or dates on which the principal of the Securities of the Series is payable;
- (5) the rate or rates (which may be fixed or variable) per annum or, if applicable, the method used to determine such rate or rates (including, but not limited to, any commodity, commodity index, stock exchange index or financial index) at which the Securities of the Series shall bear interest, if any, the date or dates from which such interest, if any, shall accrue, the date or dates on which such interest, if any, shall commence and be payable and any regular record date for the interest payable on any Interest Payment Date;
- (6) the place or places where the principal of and interest and premium, if any, on the Securities of the Series shall be payable, or the method of such payment, if by wire transfer, mail or other means;
- (7) if applicable, the period or periods within which, the price or prices at which and the terms and conditions upon which the Securities of the Series may be redeemed, in whole or in part, at the option of the Company;
- (8) the obligation, if any, of the Company to redeem or purchase the Securities of the Series pursuant to any sinking fund or analogous provisions or at the

7

option of a Holder thereof and the period or periods within which, the price or prices at which and the terms and conditions upon which Securities of the Series shall be redeemed or purchased, in whole or in part, pursuant to such obligation;

- (9) the dates, if any, on which and the price or prices at which the Securities of the Series will be repurchased by the Company at the option of the Holders thereof and other detailed terms and provisions of such repurchase obligations;
- (10) if other than denominations of \$1,000 and any integral multiple thereof, the denominations in which the Securities of the Series shall be issuable;
- (11) the forms of the Securities of the Series in bearer (if to be issued outside of the United States of America) or fully registered form (and, if in fully registered form, whether the Securities will be issuable as Global Securities);
- (12) if other than the principal amount thereof, the portion of the principal amount of the Securities of the Series that shall be payable upon declaration of acceleration of the maturity thereof pursuant to Section 6.2;

(13) the currency of denomination of the Securities of the Series, which may be Dollars or any Foreign Currency, including, but not limited to, the Euro, and if such currency of denomination is a composite currency other than the Euro, the agency or organization, if any, responsible for overseeing such composite currency;

(14) the designation of the currency, currencies or currency units in which payment of the principal of and interest and premium, if any, on the Securities of the Series will be made;

(15) if payments of principal of, interest or premium, if any, on the Securities of the Series are to be made in one or more currencies or currency units other than that or those in which such Securities are denominated, the manner in which the exchange rate with respect to such payments will be determined;

(16) the manner in which the amounts of payment of principal of and interest and premium, if any, on the Securities of the Series will be determined, if such amounts may be determined by reference to an index based on a currency or currencies or by reference to a commodity, commodity index, stock exchange index or financial index;

(17) the provisions, if any, relating to any security provided for the Securities of the Series;

(18) any addition to or change in the Events of Default which applies to any Securities of the Series and any change in the right of the Trustee or the requisite Holders of such Securities to declare the principal amount thereof due and payable pursuant to Section 6.2;

(19) any addition to or change in the covenants set forth in Articles 4 or 5 which applies to Securities of the Series;

8

(20) any other terms of the Securities of the Series (which terms shall not be inconsistent with the provisions of this Indenture, except as permitted by Section 8.1, but which may modify or delete any provision of this Indenture insofar as it applies to such Series).

(21) any depositories, interest rate calculation agents, exchange rate calculation agents or other agents with respect to Securities of such Series if other than those appointed herein;

(22) the terms and conditions, if any, upon which the Securities and any guarantees thereof shall be subordinated in right of payment to other indebtedness of the Company or any guarantor;

(23) the form and terms of any guarantee of the Securities;

(24) if applicable, that the Securities of the Series, in whole or any specified part, shall be defeasible pursuant to Article 9; and

(25) if applicable, that the Securities of the Series, in whole or any specified part, shall be convertible into equity securities of the Company

All Securities of any one Series need not be issued at the same time and may be issued from time to time, consistent with the terms of this Indenture, if so provided by or pursuant to the Board Resolution, supplemental indenture or Officers' Certificate referred to above, and the authorized principal amount of any Series may not be increased to provide for issuances of additional Securities of such Series, unless otherwise provided in such Board Resolution, supplemental indenture or Officers' Certificate.

2.3 Execution and Authentication.

The Securities shall be executed on behalf of the Company by two Officers of the Company or an Officer and an Assistant Secretary of the Company. Each such signature may be either manual or facsimile. The Company's seal may be impressed, affixed, imprinted or reproduced on the Securities and may be in facsimile form.

If an Officer whose signature is on a Security no longer holds that office at the time the Security is authenticated, the Security shall nevertheless be valid. A Security shall not be valid until authenticated by the manual signature of the Trustee or an authenticating agent. The signature shall be conclusive evidence that the Security has been authenticated under this Indenture.

The Trustee shall at any time, and from time to time, authenticate Securities for original issue in the principal amount provided in the Board Resolution, supplemental indenture hereto or Officers' Certificate, upon receipt by the Trustee of a Company Order. Such Company Order may authorize authentication and delivery pursuant to oral or electronic instructions from the Company or its duly authorized agent or agents, which oral instructions shall be promptly confirmed in writing. Each Security shall be dated the date of its authentication unless otherwise provided by a Board Resolution, a supplemental indenture hereto or an Officers' Certificate.

9

The aggregate principal amount of Securities of any Series outstanding at any time may not exceed any limit upon the maximum principal amount for such Series set forth in the Board Resolution, supplemental indenture hereto or Officers' Certificate delivered pursuant to Section 2.2, except as provided in Section 2.8.

Prior to the issuance of Securities of any Series, the Trustee shall have received and (subject to Section 7.2) shall be fully protected in relying on: (a) the Board Resolution, supplemental indenture hereto or Officers' Certificate establishing the form of the Securities of that Series or of Securities within that Series and the terms of the Securities of that Series or of Securities within that Series, (b) an Officers' Certificate complying with Section 10.4, and (c) an Opinion of Counsel complying with Section 10.4.

The Trustee shall have the right to decline to authenticate and deliver any Securities of such Series: (a) if the Trustee, being advised in writing by outside counsel, determines that such action may not lawfully be taken; or (b) if the Trustee in good faith by its board of directors or trustees, executive committee or a trust committee of directors and/or vice-presidents shall reasonably determine that such action would expose the Trustee to personal liability, or cause it to have a conflict of interest with respect to Holders of any then outstanding Series of Securities.

The Trustee may appoint an authenticating agent reasonably acceptable to the Company to authenticate Securities. An authenticating agent may authenticate Securities whenever the Trustee may do so. Any appointment shall be evidenced by instrument signed by an authorized officer of the Trustee, a copy of which shall be furnished to the Company. Each reference in this Indenture to authentication by the Trustee includes authentication by such agent. An authenticating agent has the same rights as an Agent to deal with the Company or an Affiliate of the Company.

2.4 Registrar and Paying Agent.

The Company shall maintain an office or agency where Securities of any Series may be presented for registration of transfer or for exchange (“*Registrar*”), an office or agency located in the Borough of Manhattan, City of New York, State of New York where Securities may be presented for payment (“*Paying Agent*”), and an office or agency where notices and demands to or upon the Company in respect of the Securities and this Indenture may be served (“*Service Agent*”). The Registrar shall keep a register of the Securities and of their transfer and exchange. The Company may have one or more co-registrars and one or more additional paying agents. The Company shall give prompt written notice to the Trustee of the location, and any change in the location, of such office or agency. If at any time the Company shall fail to maintain any such required office or to furnish the Trustee with the address thereof, such presentations, surrenders, notices and demands may be made or served at the address of the Trustee as set forth in Section 10.2. Neither the Company nor any Affiliate of the Company may act as Paying Agent. The Company may change any Paying Agent, Registrar or co-registrar without notice to any Securityholder.

The Company may also from time to time designate one or more other offices or agencies where the Securities may be presented or surrendered for any or all such purposes and may from time to time rescind such designations. The Company shall give prompt written notice to the

10

Trustee of such designation or rescission and of any change in the location of any such other office or agency.

The Company shall enter into an appropriate agency agreement with any Registrar or Paying Agent not a party to this Indenture. The agreement shall implement the provisions of this Indenture that relate to such Agent. The Company shall notify the Trustee of the name and address of any such Agent. If the Company fails to maintain a Registrar or Paying Agent, or agent for service of notices and demands, or fails to give the foregoing notice, the Trustee shall act as such. The Company hereby appoints the Trustee as the initial Registrar, Paying Agent and Service Agent for each Series unless another Registrar, Paying Agent or Service Agent, as the case may be, is appointed prior to the time Securities of that Series are first issued. The Company hereby initially designates the Corporate Trust Office of the Trustee as such office of the Company.

2.5 Paying Agent To Hold Assets in Trust.

The Trustee as Paying Agent shall agree, and the Company shall require each Paying Agent other than the Trustee to agree, in writing that each Paying Agent shall hold in trust for the benefit of the Holders of any Series of Securities or the Trustee all assets held by the Paying Agent for the payment of principal of, or interest or premium (if any) on, such Series of Securities (whether such assets have been distributed to it by the Company or any other obligor on such Series of Securities), and the Company and the Paying Agent shall notify the Trustee in writing of any Default by the Company (or any other obligor on such Series of Securities) in making any such payment. The Company at any time may require a Paying Agent to distribute all assets held by it to the Trustee and account for any assets disbursed, and the Trustee may at any time during the continuance of any payment default with respect to any Series of Securities, upon written request to a Paying Agent, require such Paying Agent to distribute all assets held by it to the Trustee and to account for any assets distributed. Upon distribution to the Trustee of all assets that shall have been delivered by the Company to the Paying Agent, the Paying Agent shall have no further liability for such assets.

2.6 Securityholder Lists.

The Trustee shall preserve in as current a form as is reasonably practicable the most recent list available to it of the names and addresses of Securityholders of each Series of Securities. If the Trustee is not the Registrar, the Company shall furnish to the Trustee as of each regular record date for the payment of interest on the Securities of a Series and before each related Interest Payment Date, and at such other times as the Trustee may request in writing, a list in such form and as of such date as the Trustee may reasonably require of the names and addresses of Securityholders of each Series of Securities.

2.7 Transfer and Exchange.

When Securities of a Series are presented to the Registrar with a request to register the transfer thereof, the Registrar shall register the transfer as requested if the requirements of applicable law are met, and when such Securities of a Series are presented to the Registrar with a request to exchange them for an equal principal amount of other authorized denominations of

11

Securities of the same Series, the Registrar shall make the exchange as requested. To permit transfers and exchanges, upon surrender of any Security for registration of transfer at the office or agency maintained pursuant to Section 2.4 hereof, the Company shall execute and the Trustee shall authenticate Securities at the Registrar’s request.

If Securities are issued as Global Securities, the provisions of Section 2.15 shall apply.

All Securities issued upon any registration of transfer or exchange of Securities shall be the valid obligations of the Company, evidencing the same debt, and entitled to the same benefits under this Indenture, as the Securities surrendered upon such registration of transfer or exchange.

Every Security presented or surrendered for registration of transfer or for exchange shall (if so required by the Company or the Registrar or a co-Registrar) be duly endorsed, or be accompanied by a written instrument of transfer in form satisfactory to the Company and the Registrar or a co-Registrar, duly executed by the Holder thereof or his attorney duly authorized in writing.

Any exchange or transfer shall be without charge, except that the Company may require payment by the Holder of a sum sufficient to cover any tax or other governmental charge that may be imposed in relation to a transfer or exchange, but this provision shall not apply to any exchange pursuant to Section 2.11, 3.6 or 8.5 hereof. The Trustee shall not be required to register transfers of Securities of any Series or to exchange Securities of any Series for a period of 15 days before the record date for selection for redemption of such Securities. The Trustee shall not be required to exchange or register transfers of Securities of any Series called or being called for redemption in whole or in part, except the unredeemed portion of such Security being redeemed in part.

2.8 Replacement Securities.

If a mutilated Security is surrendered to the Trustee or if the Holder of a Security presents evidence to the satisfaction of the Company and the Trustee that the Security has been lost, destroyed or wrongfully taken, the Company shall issue and the Trustee shall authenticate a replacement Security of the same Series and of like tenor and principal amount and bearing a number not contemporaneously outstanding. An indemnity bond may be required by the Company or the Trustee that is sufficient in the reasonable judgment of the Company or the Trustee, as the case may be, to protect the Company, the Trustee or any Agent from any loss which any of them may suffer if a Security is replaced. The Company may charge such Holder for its reasonable, out-of-pocket expenses in replacing a Security, including the fees and expenses of counsel. Every replacement Security shall constitute an additional obligation of the Company, whether or not the destroyed, lost or stolen Security shall be at any time enforceable by anyone, and shall be entitled to all the benefits of this Indenture equally and proportionally with any and all other Securities of that Series duly issued hereunder.

2.9 Outstanding Securities.

Securities outstanding at any time are all Securities authenticated by the Trustee except for those canceled by it, those delivered to it for cancellation, and those described in this Section 2.9 as not outstanding.

12

If a Security is replaced pursuant to Section 2.8 (other than a mutilated Security surrendered for replacement), it ceases to be outstanding until the Company and the Trustee receive proof satisfactory to each of them that the replaced Security is held by a bona fide purchaser. A mutilated Security ceases to be outstanding upon surrender of such Security and replacement thereof pursuant to Section 2.8.

If a Paying Agent holds on a Redemption Date or Maturity Date of a Series of Securities money sufficient to pay the principal of, premium, if any, and accrued interest on Securities payable on that date and is not prohibited from paying such money to the Holders thereof pursuant to the terms of this Indenture, then on and after that date such Securities cease to be outstanding and interest on them ceases to accrue.

Subject to Section 2.10, a Security does not cease to be outstanding solely because the Company or an Affiliate holds the Security.

2.10 Treasury Securities.

In determining whether the Holders of the required principal amount of Securities of a Series have concurred in any request, demand, authorization, direction, notice, consent or waiver, Securities of a Series owned by the Company or an Affiliate shall be disregarded, except that for the purposes of determining whether the Trustee shall be protected in relying on any such request, demand, authorization, direction, notice, consent or waiver only Securities of a Series that the Trustee knows are so owned shall be so disregarded.

2.11 Temporary Securities.

Until definitive Securities are ready for delivery, the Company may prepare and the Trustee shall authenticate temporary Securities. Temporary Securities shall be substantially in the form, and shall carry all rights, of definitive Securities but may have variations that the Company considers appropriate for temporary Securities. Without unreasonable delay, the Company shall prepare and the Trustee shall authenticate definitive Securities in exchange for temporary Securities presented to it.

2.12 Cancellation.

The Company at any time may deliver Securities to the Trustee for cancellation. The Registrar and the Paying Agent shall forward to the Trustee any Securities surrendered to them for transfer, exchange or payment. At the direction of the Trustee, the Registrar or the Paying Agent, and no one else, shall cancel and at the written request of the Company, shall dispose of all Securities surrendered for transfer, exchange, payment or cancellation. If the Company shall acquire any of the Securities, such acquisition shall not operate as a redemption or satisfaction of the Indebtedness represented by such Securities unless and until the same are surrendered to the Trustee for cancellation pursuant to this Section 2.12.

2.13 Payment of Interest; Defaulted Interest; Computation of Interest.

Except as otherwise provided as contemplated by Section 2.2 with respect to any Series of Securities, interest on any Security which is payable, and is punctually paid or duly

13

provided for, on any Interest Payment Date shall be paid to the Person in whose name that Security is registered at the close of business on the regular record date for such interest, as provided in the Board Resolution, supplemental indenture hereto or Officers' Certificate establishing the terms of such Series.

With respect to any Holder with an aggregate principal amount of Securities of any Series in an amount in excess of \$2,000,000, upon receipt by the Trustee of a written request from such Holder, payments of interest with respect to such Securities shall be made to such Holder by wire transfer of

immediately available funds. Each other Holder shall receive payments of interest by check or by transfer to an account maintained by such Holder in the United States.

If the Company defaults in a payment of interest on the Securities, it shall pay the defaulted amounts, plus any interest payable on defaulted amounts pursuant to Section 4.1 hereof, to the persons who are Securityholders on a subsequent special record date, which date shall be the fifteenth day next preceding the date fixed by the Company for the payment of defaulted interest or the next succeeding Business Day if such date is not a Business Day. At least 15 days before the special record date, the Company shall mail or cause to be mailed to each Securityholder, with a copy to the Trustee, a notice that states the special record date, the payment date, and the amount of defaulted interest, and interest payable on such defaulted interest, if any, to be paid.

Except as otherwise specified as contemplated by Section 2.2 for Securities of any Series, interest on the Securities of each Series shall be computed on the basis of a 360-day year of twelve 30-day months.

2.14 CUSIP Number.

The Company in issuing the Securities may use one or more "CUSIP" numbers, and if so, the Trustee shall use the CUSIP number(s) in notices of redemption or exchange as a convenience to Holders, provided that any such notice may state that no representation is made as to the correctness or accuracy of the CUSIP number(s) printed in the notice or on the Securities, and that reliance may be placed only on the other identification numbers printed on the Securities.

2.15 Provisions for Global Securities.

(a) A Board Resolution, a supplemental indenture hereto or an Officers' Certificate shall establish whether the Securities of a Series shall be issued in whole or in part in the form of one or more Global Securities, and the Depositary for such Global Securities or Securities.

(b) Notwithstanding any provisions to the contrary contained in Section 2.7 and in addition thereto, if, and only if the Depositary (i) at any time is unwilling or unable to continue as Depositary for such Global Security or ceases to be a clearing agency registered under the Exchange Act and (ii) a successor Depositary is not appointed by the Company within 90 days after the date the Company is so informed in writing or becomes aware of the same, the Company promptly will execute and deliver to the

14

Trustee definitive Securities, and the Trustee, upon receipt of a Company Request for the authentication and delivery of such definitive Securities (which the Company will promptly execute and deliver to the Trustee) and an Officers' Certificate to the effect that such Global Security shall be so exchangeable, will authenticate and deliver definitive Securities, without charge, registered in such names and in such authorized denominations as the Depositary shall direct in writing (pursuant to instructions from its direct and indirect participants or otherwise) in an aggregate principal amount equal to the principal amount of the Global Security with like tenor and terms. Upon the exchange of a Global Security for definitive Securities, such Global Security shall be canceled by the Trustee. Unless and until it is exchanged in whole or in part for definitive Securities, as provided in this Section 2.15(b), a Global Security may not be transferred except as a whole by the Depositary with respect to such Global Security to a nominee of such Depositary, by a nominee of such Depositary to such Depositary or another nominee of such Depositary or by the Depositary or any such nominee to a successor Depositary or a nominee of such a successor Depositary.

(c) Any Global Security issued hereunder shall bear a legend in substantially the following form:

"This Security is a Global Security within the meaning of the Indenture hereinafter referred to, and is registered in the name of the Depositary or a nominee of the Depositary. This Security is exchangeable for Securities registered in the name of a Person other than the Depositary or its nominee only in the limited circumstances described in the Indenture, and may not be transferred except as a whole by the Depositary to a nominee of the Depositary, by a nominee of the Depositary to the Depositary or another nominee of the Depositary or by the Depositary or any such nominee to a successor Depositary or a nominee of such a successor Depositary."

(d) The Depositary, as a Holder, may appoint agents and otherwise authorize participants to give or take any request, demand, authorization, direction, notice, consent, waiver or other action which a Holder is entitled to give or take under the Indenture.

(e) Notwithstanding the other provisions of this Indenture, unless otherwise specified as contemplated by Section 2.2, payment of the principal of, and interest and premium, if any, on, any Global Security shall be made to the Depositary or its nominee in its capacity as the Holder thereof.

(f) Except as provided in Section 2.15(e) above, the Company, the Trustee and any Agent shall treat a Person as the Holder of such principal amount of outstanding Securities of any Series represented by a Global Security as shall be specified in a written statement of the Depositary (which may be in the form of a participants' list for such Series) with respect to such Global Security, for purposes of obtaining any consents, declarations, waivers or directions required to be given by the Holders pursuant to this Indenture, PROVIDED, that until the Trustee is so provided with a written statement, it may treat the Depositary or any other Person in whose name a Global Security is registered as the owner of such Global Security for the purpose of receiving payment of

15

the principal of, and any premium and (subject to Section 2.13) any interest on, such Global Security and for all other purposes whatsoever, and none of the Company, the Trustee or any agent of the Company or the Trustee shall be affected by notice to the contrary.

2.16 Persons Deemed Owners.

Prior to due presentment of a Security for registration of transfer, the Company, the Trustee, the Registrar and any agent of the Company, the Registrar or the Trustee may treat the Person in whose name such Security is registered as the owner of such Security for the purpose of receiving payment of

principal of and any premium and (subject to Section 2.13) any interest on such Security and for all other purposes whatsoever, and neither the Company, the Trustee, the Registrar nor any agent of the Company, the Registrar or the Trustee shall be affected by notice to the contrary.

ARTICLE 3

REDEMPTION

3.1 Notices of Trustee.

The Company may, with respect to any Series of Securities, reserve the right to redeem and pay the Series of Securities or may covenant to redeem and pay the Series of Securities or any part thereof prior to the Stated Maturity thereof at such time and on such terms as provided for in such Securities or the related Board Resolution, supplemental indenture or Officers' Certificate. If a Series of Securities is redeemable and the Company elects to redeem such Securities of a Series, it shall notify the Trustee of the Redemption Date and the principal amount of Securities to be redeemed at least 35 days (unless a shorter notice shall be satisfactory to the Trustee) but not more than 60 days before the Redemption Date. Any such notice may be canceled at any time prior to notice of such redemption being mailed to any Holder and shall thereby be void and of no effect.

3.2 Selection by Trustee of Securities to Be Redeemed.

Unless otherwise indicated for a particular Series of Securities by a Board Resolution, a supplemental indenture or an Officers' Certificate, if fewer than all of the Securities of a Series are to be redeemed, the Trustee shall select the Securities of a Series to be redeemed pro rata, by lot or by any other method that the Trustee considers fair and appropriate and, if such Securities are listed on any securities exchange, by a method that complies with the requirements of such exchange.

The Trustee shall make the selection from Securities of a Series outstanding and not previously called for redemption and shall promptly notify the Company in writing of the Securities selected for redemption and, in the case of any Security selected for partial redemption, the principal amount thereof to be redeemed. Securities of a Series in denominations of \$1,000 may be redeemed only in whole. The Trustee may select for redemption portions of the principal of Securities of a Series that have denominations larger than \$1,000. Securities of a Series and portions of them it selects shall be in amounts of \$1,000 or,

16

with respect to Securities of any Series issuable in other denominations pursuant to Section 2.2(10), the minimum principal denomination for each Series and integral multiples thereof. Provisions of this Indenture that apply to Securities called for redemption also apply to portions of Securities called for redemption.

3.3 Notice of Redemption.

Unless otherwise indicated for a particular Series by Board Resolution, a supplemental indenture hereto or an Officers' Certificate, at least 30 days, and no more than 60 days, before a Redemption Date, the Company shall mail, or cause to be mailed, a notice of redemption by first-class mail to each Holder of Securities to be redeemed at his or her last address as the same appears on the registry books maintained by the Registrar.

The notice shall identify the Securities to be redeemed (including the CUSIP number(s) thereof, if any) and shall state:

- (1) the Redemption Date;
- (2) the redemption price;
- (3) if any Security of a Series is being redeemed in part, the portion of the principal amount of such Security of a Series to be redeemed and that, after the Redemption Date and upon surrender of such Security of a Series, a new Security or Securities in principal amount equal to the unredeemed portion will be issued;
- (4) the name and address of the Paying Agent;
- (5) that Securities of a Series called for redemption must be surrendered to the Paying Agent to collect the redemption price, and the place or places where each such Security is to be surrendered for such payment;
- (6) that, unless the Company defaults in making the redemption payment, interest on the Securities of a Series called for redemption ceases to accrue on or after the Redemption Date, and the only remaining right of the Holders of such Securities is to receive payment of the redemption price upon surrender to the Paying Agent of the Securities redeemed; and
- (7) if fewer than all the Securities of a Series are to be redeemed, the identification of the particular Securities of a Series (or portion thereof) to be redeemed, as well as the aggregate principal amount of Securities of a Series to be redeemed and the aggregate principal amount of Securities of a Series to be outstanding after such partial redemption.

At the Company's request, the Trustee shall give the notice of redemption in the Company's name and at the Company's sole expense.

17

3.4 Effect of Notice of Redemption.

Once the notice of redemption described in Section 3.3 is mailed, Securities of a Series called for redemption become due and payable on the Redemption Date and at the redemption price, plus interest, if any, accrued to (but not including) the Redemption Date. Upon surrender to the Trustee or

Paying Agent, such Securities of a Series shall be paid at the redemption price, plus accrued interest, if any, to (but not including) the Redemption Date, provided that if the Redemption Date is after a regular interest payment record date and on or prior to the next Interest Payment Date, the accrued interest shall be payable to the Holder of the redeemed Securities registered on the relevant record date, as specified by the Company in the notice to the Trustee pursuant to Section 3.1 hereof.

3.5 Deposit of Redemption Price.

On or prior to the Redemption Date, the Company shall deposit with the Paying Agent money sufficient to pay the redemption price of and accrued interest, if any, on all Securities to be redeemed on that date other than Securities or portions thereof called for redemption on that date which have been delivered by the Company to the Trustee for cancellation.

On and after any Redemption Date, if money sufficient to pay the redemption price of and accrued interest on Securities called for redemption shall have been made available in accordance with the preceding paragraph and the Company and the Paying Agent are not prohibited from paying such moneys to Holders, the Securities called for redemption will cease to accrue interest and the only right of the Holders of such Securities will be to receive payment of the redemption price of and, subject to the proviso in Section 3.4, accrued and unpaid interest on such Securities to the Redemption Date. If any Security called for redemption shall not be so paid, interest will be paid, from the Redemption Date until such redemption payment is made, on the unpaid principal of the Security and any interest or premium (if any) not paid on such unpaid principal, in each case, at the rate and in the manner provided in the Securities.

3.6 Securities Redeemed in Part.

Upon surrender of a Security of a Series that is redeemed in part, the Trustee shall authenticate for a Holder a new Security of the same Series equal in principal amount to the unredeemed portion of the Security surrendered.

ARTICLE 4

COVENANTS

4.1 Payment of Securities.

The Company shall pay the principal of and interest and premium, if any, on each Series of Securities on the dates and in the manner provided in such Securities and this Indenture.

An installment of principal or interest shall be considered paid on the date it is due if the Trustee or Paying Agent holds on that date money designated for and sufficient to pay such

18

installment and is not prohibited from paying such money to the Holders pursuant to the terms of this Indenture or otherwise.

The Company shall pay interest on overdue principal, and overdue interest, to the extent lawful, at the rate specified in the Series of Securities.

4.2 SEC Reports.

The Company will deliver to the Trustee and the Holders of Securities within 15 days after the filing of the same with the SEC, copies of the quarterly and annual reports and of the information documents and other reports, if any, which the Company is required to file with the SEC pursuant to Section 13 or 15(d) of the Exchange Act; provided, however, that each such report or document will be deemed to be so delivered to the Trustee if the Company files such report or document with the SEC through the SEC's EDGAR database no later than the time such report is required to be filed with the SEC pursuant to the Exchange Act. Notwithstanding that the Company may not be subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, the Company will file with the SEC, to the extent permitted, and provide the Trustee, Holders of each Series of Securities and prospective holders of each Series of Securities with such quarterly and annual reports and such information, documents and other reports specified in Section 13 and 15(d) of the Exchange Act. The Company will also comply with the other provisions of TIA Section 314(a).

4.3 Waiver of Stay, Extension or Usury Laws.

The Company covenants (to the extent that it may lawfully do so) that they will not at any time insist upon, or plead (as a defense or otherwise) or in any manner whatsoever claim or take the benefit or advantage of, any stay, extension law, usury law or other law which would prohibit or forgive the Company from paying all or any portion of the principal of, premium, if any, and/or interest on the Securities as contemplated herein, wherever enacted, now or at any time hereafter in force, or which may affect the covenants or the performance of this Indenture; and (to the extent that they may lawfully do so) the Company hereby expressly waives all benefit or advantage of any such law, and covenants that it will not hinder, delay or impede the execution of any power herein granted to the Trustee, but will suffer and permit the execution of every such power as though no such law had been enacted.

4.4 Compliance Certificate.

(a) The Company shall deliver to the Trustee, within 90 days after the end of each fiscal year of the Company, an Officers' Certificate which complies with TIA Section 314(a)(4) stating that a review of the activities of the Company and its Subsidiaries during such fiscal year has been made under the supervision of the signing Officers with a view to determining whether each has kept, observed, performed and fulfilled its obligations under this Indenture, and further stating, as to each such Officer signing such certificate, that to the best of his or her knowledge each has kept, observed, performed and fulfilled each and every covenant contained in this Indenture and is not in default in the performance or observance of any of the terms, provisions and conditions hereof (or, if a Default or Event of Default shall have occurred, describing all such

19

Defaults or Events of Default of which he or she may have knowledge and what action each is taking or proposes to take with respect thereto) and that to the best of his or her knowledge no event has occurred and remains in existence by reason of which payments on account of the principal of or interest or premium, if any, on the Securities is prohibited or if such event has occurred, a description of the event and what action each is taking or proposes to take with respect thereto.

(b) (i) If any Default or Event of Default has occurred and is continuing or (ii) if any Holder seeks to exercise any remedy hereunder with respect to a claimed Default under this Indenture or the Securities, the Company shall deliver to the Trustee an Officers' Certificate specifying such event, notice or other action within five Business Days of its becoming aware of such occurrence and what action the Company is taking or proposes to take with respect thereto.

4.5 Payment of Taxes and Other Claims.

The Company shall pay or discharge or cause to be paid or discharged, before the same shall become delinquent, (i) all taxes, assessments and governmental charges (including withholding taxes and any penalties, interest and additions to taxes) levied or imposed upon it or any of its Significant Subsidiaries or properties of it or any of its Significant Subsidiaries and (ii) all lawful claims for labor, materials and supplies that, if unpaid, might by law become a Lien upon the property of it or any of its Significant Subsidiaries; provided, however, that neither the Company nor any of its Significant Subsidiaries shall be required to pay or discharge or cause to be paid or discharged any such tax, assessment, charge or claim if the amount, applicability or validity thereof is being contested in good faith by appropriate proceedings and an adequate reserve has been established therefor to the extent required by GAAP.

4.6 Corporate Existence.

Subject to Article 5 hereof, the Company shall do or cause to be done all things necessary to preserve and keep in full force and effect its corporate existence, and the corporate, partnership or other existence of each Significant Subsidiary, in accordance with the respective organizational documents (as the same may be amended from time to time) of the Company and of each Significant Subsidiary, and the rights (charter and statutory), licenses and franchises of the Company and its Significant Subsidiaries; provided, however, that the Company shall not be required to preserve any such right, license or franchise, or the corporate, partnership or other existence of any of its Significant Subsidiaries, if the Board of Directors shall determine that the preservation thereof is no longer desirable in the conduct of the business of the Company and its Significant Subsidiaries, taken as a whole, and that the loss thereof is not adverse in any material respect to the Holders.

4.7 Maintenance of Properties.

The Company will cause all properties used or useful in the conduct of its business or the business of any Subsidiary to be maintained and kept in good condition, repair and working order and supplied with all necessary equipment and will cause to be made all necessary repairs, renewals, replacements, betterments and improvements thereof, all as in the judgment of the

20

Company may be necessary so that the business carried on in connection therewith may be properly and advantageously conducted at all times; provided, however, that nothing in this Section 4.7 shall prevent the Company from discontinuing the operation or maintenance of any of such properties if such discontinuance is, in the judgment of the Company, desirable in the conduct of its business or the business of any Subsidiary and not disadvantageous in any material respect to the Holders.

ARTICLE 5

SUCCESSOR CORPORATION

5.1 Limitation on Consolidation, Merger and Sale of Assets.

(a) The Company will not, in any transaction or series of transactions, merge or consolidate with or into, or sell, assign, convey, transfer, lease or otherwise dispose of all or substantially all of its properties and assets (as an entirety or substantially as an entirety in one transaction or a series of related transactions), to any Person or Persons, and the Company will not permit any of its Significant Subsidiaries to enter into any such transaction or series of transactions if such transaction or series of transactions, in the aggregate, would result in a sale, assignment, conveyance, transfer, lease or other disposition of all or substantially all of the properties and assets of the Company or the Company and its Significant Subsidiaries, taken as a whole, to any other Person or Persons, unless at the time of and after giving effect thereto (i) either (A) if the transaction or series of transactions is a merger or consolidation, the Company shall be the surviving Person of such merger or consolidation, or (B) the Person formed by such consolidation or into which the Company or such Significant Subsidiary is merged or to which the properties and assets of the Company or such Significant Subsidiary, as the case may be, are transferred (any such surviving person or transferee Person being the "Surviving Entity") shall be a corporation organized and existing under the laws of the United States of America, any state thereof or the District of Columbia and shall expressly assume by a supplemental indenture executed and delivered to the Trustee, in form reasonably satisfactory to the Trustee, all the obligations of the Company (including, without limitation, the obligation to pay the principal of, and premium and interest, if any, on the Securities and the performance of the other covenants) under the Securities of each Series and this Indenture, and in each case, this Indenture shall remain in full force and effect; and (ii) immediately after giving effect to such transaction or series of transactions on a pro forma basis (including, without limitation, any Indebtedness incurred or anticipated to be incurred in connection with or in respect of such transaction or series of transactions), no Default or Event of Default shall have occurred and be continuing.

(b) In connection with any consolidation, merger or transfer of assets contemplated by this Section 5.1, the Company shall deliver, or cause to be delivered, to the Trustee, in form and substance reasonably satisfactory to the Trustee, an Officers' Certificate and an Opinion of Counsel, each stating that such consolidation, merger or transfer and the supplemental indenture in respect thereto comply with this Section 5.1

21

and that all conditions precedent herein provided for relating to such transaction or transactions have been complied with.

5.2 Successor Person Substituted.

Upon any consolidation or merger, or any transfer of all or substantially all of the assets of the Company or any Significant Subsidiary in accordance with Section 5.1 above, the successor corporation formed by such consolidation or into which the Company is merged or to which such transfer is made shall succeed to, and be substituted for, and may exercise every right and power of, the Company under this Indenture with the same effect as if such successor corporation had been named as the Company herein, and thereafter (except with respect to any such transfer which is a lease) the predecessor corporation shall be relieved of all obligations and covenants under this Indenture and the Securities.

ARTICLE 6

DEFAULTS AND REMEDIES

6.1 Events of Default.

“*Events of Default*,” wherever used herein with respect to Securities of any Series, means any one of the following events, unless in the establishing Board Resolution, supplemental indenture or Officers’ Certificate, it is provided that such Series shall not have the benefit of said Event of Default:

- (1) there is a default in the payment of any principal of, or premium, if any, on the Securities when the same becomes due and payable at maturity, upon acceleration, redemption or otherwise;
 - (2) there is a default in the payment of any interest on any Security of a Series when the same becomes due and payable and the Default continues for a period of 45 days;
 - (3) the Company defaults in the observance or performance of any other covenant in the Securities of a Series or this Indenture for 45 days after written notice from the Trustee or the Holders of not less than 25% in the aggregate principal amount of the Securities of such Series then outstanding;
 - (4) the Company or any Significant Subsidiary pursuant to or within the meaning of any Bankruptcy Law:
 - (A) commences a voluntary case,
 - (B) consents to the entry of an order for relief against it in an involuntary case,
 - (C) consents to the appointment of a Custodian of it or for all or substantially all of its property,
-
- (D) makes a general assignment for the benefit of its creditors, or
 - (E) generally is not paying its debts as they become due;
- (5) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that:
 - (A) is for relief against the Company or any Significant Subsidiary in an involuntary case;
 - (B) appoints a Custodian of the Company or any Significant Subsidiary or for all or substantially all of the property of the Company or any Significant Subsidiary; or
 - (C) orders the liquidation of the Company or any Significant Subsidiary, and the order or decree remains unstayed and in effect for 60 days; or
 - (6) any other Event of Default provided with respect to Securities of that Series, which is specified in a Board Resolution, a supplemental indenture hereto or an Officers’ Certificate, in accordance with Section 2.2(18).

The Trustee may withhold notice of any Default (except in payment of principal or premium, if any, or interest on the Securities) to the Holders of the Securities of any Series in accordance with Section 7.5.

6.2 Acceleration.

If an Event of Default with respect to Securities of any Series at the time outstanding (other than an Event of Default arising under Section 6.1(4) or (5)) occurs and is continuing, the Trustee by written notice to the Company, or the Holders of not less than 25% in aggregate principal amount of the Securities of that Series then outstanding may by written notice to the Company and the Trustee declare that the entire principal amount of all the Securities of that Series then outstanding plus accrued and unpaid interest to the date of acceleration are immediately due and payable, in which case such amounts shall become immediately due and payable; provided, however, that after such acceleration but before a judgment or decree based on such acceleration is obtained by the Trustee, the Holders of a majority in aggregate principal amount of the outstanding Securities of that Series may rescind and annul such acceleration and its consequences if (i) all existing Events of Default, other than the nonpayment of accelerated principal, premium, if any, or interest that has become due solely because of the acceleration, have been cured or waived, (ii) to the extent the payment of such interest is lawful, interest on overdue installments of interest and overdue principal, which has become due otherwise than by such declaration of acceleration, has been paid and (iii) if the rescission would not conflict with any judgment or decree. No such rescission shall affect any subsequent Default or impair any right consequent thereto. In case an Event of Default specified in Section 6.1(4) or (5) with respect to the Company occurs, such principal, premium, if any, and interest amount with respect to all of the Securities of that Series shall be due and payable immediately without any declaration or other act on the part of the Trustee or the Holders of the Securities of that Series.

6.3 Other Remedies.

If an Event of Default with respect to Securities of any Series at the time outstanding occurs and is continuing, the Trustee may pursue any available remedy by proceeding at law or in equity to collect the payment of principal of, or premium, if any, and interest on the Securities of that Series or to enforce the performance of any provision of the Securities of that Series or this Indenture.

The Trustee may maintain a proceeding even if it does not possess any of the Securities of that Series or does not produce any of them in the proceeding. A delay or omission by the Trustee or any Securityholder in exercising any right or remedy accruing upon an Event of Default shall not impair the right or remedy or constitute a waiver of or acquiescence in the Event of Default. No remedy is exclusive of any other remedy. All available remedies are cumulative to the extent permitted by law.

6.4 Waiver of Past Defaults and Events of Default.

Subject to Sections 6.2, 6.7 and 8.2 hereof, the Holders of a majority in principal amount of the Securities of any Series then outstanding have the right to waive any existing Default or Event of Default with respect to such Series or compliance with any provision of this Indenture (with respect to such Series) or the Securities of such Series. Upon any such waiver, such Default with respect to such Series shall cease to exist, and any Event of Default with respect to such Series arising therefrom shall be deemed to have been cured for every purpose of this Indenture; but no such waiver shall extend to any subsequent or other Default or Event of Default or impair any right consequent thereto.

6.5 Control by Majority.

The Holders of a majority in principal amount of the Securities of any Series then outstanding may direct the time, method and place of conducting any proceeding for any remedy available to the Trustee or exercising any trust or power conferred on the Trustee by this Indenture with respect to such Series. The Trustee, however, may refuse to follow any direction that conflicts with law or this Indenture or that the Trustee determines may be unduly prejudicial to the rights of another Securityholder or that may involve the Trustee in personal liability; provided that the Trustee may take any other action deemed proper by the Trustee which is not inconsistent with such direction.

6.6 Limitation on Suits.

Subject to Section 6.7 below, a Securityholder may not institute any proceeding or pursue any remedy with respect to this Indenture or the Securities of a Series unless:

- (1) the Holder gives to the Trustee written notice of a continuing Event of Default with respect to the Securities of that Series;
- (2) the Holders of at least 25% in aggregate principal amount of the Securities of such Series then outstanding make a written request to the Trustee to pursue the remedy;

- (3) such Holder or Holders offer to the Trustee indemnity reasonably satisfactory to the Trustee against any loss, liability or expense to be incurred in compliance with such request;

- (4) the Trustee does not comply with the request within 60 days after receipt of the request and the offer of indemnity; and

- (5) no direction inconsistent with such written request has been given to the Trustee during such 60-day period by the Holders of a majority in aggregate principal amount of the Securities of such Series then outstanding.

A Securityholder may not use this Indenture to prejudice the rights of another Securityholder or to obtain a preference or priority over another Securityholder.

6.7 Rights of Holders To Receive Payment.

Notwithstanding any other provision of this Indenture, the right of any Holder of a Security of a Series to receive payment of principal of, or premium, if any, and interest of the Security of such Series on or after the respective due dates expressed in the Security of such Series, or to bring suit for the enforcement of any such payment on or after such respective dates, is absolute and unconditional and shall not be impaired or affected without the consent of the Holder.

6.8 Collection Suit by Trustee.

If an Event of Default in payment of principal, premium or interest specified in Section 6.1(1) or (2) hereof with respect to Securities of any Series at the time outstanding occurs and is continuing, the Trustee may recover judgment in its own name and as trustee of an express trust against the Company (or any other obligor on the Securities of that Series) for the whole amount of unpaid principal and accrued interest remaining unpaid, together with interest on overdue principal and, to the extent that payment of such interest is lawful, interest on overdue installments of interest, in each case at the rate then borne by the Securities of that Series, and such further amounts as shall be sufficient to cover the costs and expenses of collection, including the reasonable compensation, expenses, disbursements and advances of the Trustee, its agents and counsel.

6.9 Trustee May File Proofs of Claim.

The Trustee may file such proofs of claim and other papers or documents as may be necessary or advisable in order to have the claims of the Trustee (including any claim for the reasonable compensation, expenses, disbursements and advances of the Trustee, its agents and counsel) and the Securityholders allowed in any judicial proceedings relative to the Company (or any other obligor upon the Securities), any of their respective creditors or any of their respective property and shall be entitled and empowered to collect and receive any monies or other property payable or deliverable on any such claims and to distribute the same after deduction of its charges and expenses to the extent that any such charges and expenses are not paid out of the estate in any such proceedings and any custodian in any such judicial proceeding is hereby authorized by each Securityholder to make such payments to the Trustee, and in the event that

the Trustee shall consent to the making of such payments directly to the Securityholders, to pay to the Trustee any amount due to it for the reasonable compensation, expenses, disbursements and advances of the Trustee, its agents and counsel, and any other amounts due the Trustee under Section 7.7 hereof.

Nothing herein contained shall be deemed to authorize the Trustee to authorize or consent to or accept or adopt on behalf of any Securityholder any plan or reorganization, arrangement, adjustment or composition affecting the Securities of a Series or the rights of any Holder thereof, or to authorize the Trustee to vote in respect of the claim of any Securityholder in any such proceedings.

6.10 Priorities.

If the Trustee collects any money pursuant to this Article 6, it shall pay out the money in the following order:

FIRST: to the Trustee for amounts due under Section 7.7 hereof;

SECOND: to Securityholders for amounts then due and unpaid for principal, premium, if any, and interest on the Securities in respect of which or for the benefit of which such money has been collected, ratably, without preference or priority of any kind, according to the amounts due and payable on such Securities for principal and any premium and interest, respectively; and

THIRD: to the Company.

The Trustee may fix a record date and payment date for any payment to Securityholders pursuant to this Section 6.10.

6.11 Undertaking for Costs.

In any suit for the enforcement of any right or remedy under this Indenture or in any suit against the Trustee for any action taken or omitted by it as Trustee, a court in its discretion may require the filing by any party litigant in the suit of an undertaking to pay the costs of the suit, and the court in its discretion may assess reasonable costs, including reasonable attorneys' fees, against any party litigant in the suit, having due regard to the merits and good faith of the claims or defenses made by the party litigant. This Section 6.11 does not apply to a suit by the Trustee, a suit by a Holder pursuant to Section 6.7 hereof or a suit by Holders of more than 10% in principal amount of the Securities of a Series then outstanding.

ARTICLE 7

TRUSTEE

7.1 Duties of Trustee.

(a) If an Event of Default has occurred and is continuing, the Trustee shall exercise such of the rights and powers vested in it by this Indenture and use the same

degree of care and skill in its exercise as a prudent person would exercise or use under the same circumstances in the conduct of his own affairs.

(b) Except during the continuance of an Event of Default:

(i) The Trustee need perform only those duties that are specifically set forth in this Indenture and no covenants or obligations shall be implied in this Indenture against the Trustee.

(ii) In the absence of bad faith on its part, the Trustee may conclusively rely, as to the truth of the statements and the correctness of the opinions expressed therein, upon certificates or opinions furnished to the Trustee and conforming to the requirements of this Indenture but, in the case of any such certificates or opinions which by any provision hereof are specifically required to be furnished to the Trustee, the Trustee shall be under a duty to examine the same to determine whether or not they conform to the requirements of this Indenture.

(c) The Trustee may not be relieved from liability for its own negligent action, its own negligent failure to act, or its own willful misconduct, except that:

(i) This paragraph does not limit the effect of paragraph (b) of this Section 7.1.

(ii) The Trustee shall not be liable for any error of judgment made in good faith by a Responsible Officer, unless it is proved that the Trustee was negligent in ascertaining the pertinent facts.

(iii) The Trustee shall not be liable with respect to any action it takes or omits to take in good faith in accordance with a direction received by it pursuant to Sections 6.2 and 6.5 hereof.

(d) No provision of this Indenture shall require the Trustee to expend or risk its own funds or otherwise incur any financial liability in the performance of any of its rights or powers if it shall have reasonable grounds for believing that repayment of such funds or adequate indemnity satisfactory to it against such risk or liability is not reasonably assured to it.

(e) Whether or not therein expressly so provided, paragraphs (a), (b), (c) and (d) of this Section 7.1 shall govern every provision of this Indenture that in any way relates to the Trustee.

(f) The Trustee shall not be liable for interest on any money received by it except as the Trustee may agree in writing with the Company. Money held in trust by the Trustee need not be segregated from other funds except to the extent required by the law.

27

(g) The Paying Agent, the Registrar and any authenticating agent shall be entitled to the protections, immunities and standard of care set forth in paragraphs (a), (b), (c), and (d) of this Section 7.1 and in Section 7.2 with respect to the Trustee.

7.2 Rights of Trustee.

(a) Subject to Section 7.1 hereof:

(i) The Trustee may rely on and shall be protected in acting or refraining from acting upon any document reasonably believed by it to be genuine and to have been signed or presented by the proper person. The Trustee need not investigate any fact or matter stated in the document.

(ii) Before the Trustee acts or refrains from acting, it may require an Officers' Certificate or an Opinion of Counsel, or both, which shall conform to the provisions of Section 10.5 hereof. The Trustee shall be protected and shall not be liable for any action it takes or omits to take in good faith in reliance on such certificate or opinion.

(iii) The Trustee may act through agents and shall not be responsible for the misconduct or negligence of any agent appointed by it with due care.

(iv) The Trustee shall not be liable for any action it takes or omits to take in good faith which it reasonably believes to be authorized or within its rights or powers.

(v) The Trustee may consult with counsel of its selection, and the advice or opinion of such counsel as to matters of law shall be full and complete authorization and protection from liability in respect of any action taken, omitted or suffered by it hereunder in good faith and in accordance with the advice or opinion of such counsel.

(vi) The Trustee shall be under no obligation to exercise any of the rights or powers vested in it by this Indenture at the request, order or direction of any of the Holders pursuant to the provisions of this Indenture, unless such Holders shall have offered to the Trustee reasonable security or indemnity against the costs, expenses and liabilities which may be incurred therein or thereby.

(vii) The Trustee shall not be deemed to have knowledge of any fact or matter unless such fact or matter is known to a Responsible Officer of the Trustee.

7.3 Individual Rights of Trustee.

The Trustee in its individual or any other capacity may become the owner or pledgee of Securities and may make loans to, accept deposits from, perform services for or otherwise deal

28

with the Company, or any Affiliate thereof, with the same rights it would have if it were not Trustee. Any Agent may do the same with like rights. The Trustee, however, shall be subject to Sections 7.10 and 7.11 hereof.

7.4 Trustee's Disclaimer.

The Trustee makes no representation as to the validity or adequacy of this Indenture or the Securities (except that the Trustee represents that it is duly authorized to execute and deliver this Indenture and authenticate the Securities and perform its obligations hereunder), it shall not be accountable for the Company's use of the proceeds from the sale of Securities or any money paid to the Company pursuant to the terms of this Indenture and it shall not be responsible for any statement in the Securities other than its certificates of authentication.

7.5 Notice of Default.

If a Default or an Event of Default occurs and is continuing with respect to the Securities of any Series and if it is known to the Trustee, the Trustee shall mail to each Securityholder of the Securities of that Series notice of the Default or the Event of Default, as the case may be, within 30 days after it occurs. Except in the case of a Default or an Event of Default in payment of the principal of, or premium, if any, or interest on any Security of any Series, the Trustee may withhold the notice if and so long as the Board of Directors of the Trustee, the executive committee or any trust committee of such board and/or its Responsible Officers in good faith determine(s) that withholding the notice is in the interests of the Securityholders of that Series.

7.6 Reports by Trustee to Holders.

If and to the extent required by the TIA, within 60 days after May 15 of each year, commencing the May 15 following the date of this Indenture, the Trustee shall mail to each Securityholder a brief report dated as of such May 15 that complies with TIA Section 313(a). The Trustee also shall comply with TIA Sections 313(b) and 313(c).

If and to the extent required by the TIA, a copy of each report at the time of its mailing to Securityholders shall be filed with the SEC and any stock exchange on which the Securities of that Series are listed. The Company shall promptly notify the Trustee when the Securities of any Series are listed on any stock exchange, and the Trustee shall comply with TIA Section 313(d).

7.7 Compensation and Indemnity.

The Company shall pay to the Trustee from time to time reasonable compensation for its services. The Trustee's compensation shall not be limited by any provision of law on compensation of a trustee of an express trust. The Company shall reimburse the Trustee upon request for all reasonable disbursements, expenses and advances incurred or made by it in connection with its duties under this Indenture, including the reasonable compensation, disbursements and expenses of the Trustee's agents and counsel.

The Company shall indemnify the Trustee for, and hold it harmless against, any and all loss or liability incurred by it in connection with the acceptance or performance of its duties under this Indenture including the reasonable costs and expenses of defending itself against any

claim or liability in connection with the exercise or performance of any of its powers or duties hereunder. The Trustee shall notify the Company promptly of any claim asserted against the Trustee for which it may seek indemnity. However, the failure by the Trustee to so notify the Company shall not relieve the Company of its obligations. Notwithstanding the foregoing, the Company need not reimburse the Trustee for any expense or indemnify it against any loss or liability incurred by the Trustee through its negligence or bad faith.

To secure the payment obligations of the Company in this Section 7.7, the Trustee shall have a Lien prior to the Securities of any Series on all money or property held or collected by the Trustee, except such money or property held in trust to pay principal of and interest and premium (if any) on particular Securities of that Series.

When the Trustee incurs expenses or renders services after an Event of Default specified in Section 6.1(4) or (5) hereof occurs, the expenses and the compensation for the services are intended to constitute expenses of administration under any Bankruptcy Law.

For purposes of this Section 7.7, the term "Trustee" shall include any trustee appointed pursuant to Article 9.

7.8 Replacement of Trustee.

The Trustee may resign with respect to the Securities of one or more Series by so notifying the Company in writing at least 90 days in advance of such resignation.

The Holders of a majority in principal amount of the outstanding Securities of any Series may remove the Trustee with respect to that Series by notifying the removed Trustee in writing and may appoint a successor Trustee with respect to that Series with the written consent of the Company, which consent shall not be unreasonably withheld. The Company may remove the Trustee with respect to that Series at its election if:

- (1) the Trustee fails to comply with, or ceases to be eligible under, Section 7.10 hereof;
- (2) the Trustee is adjudged a bankrupt or an insolvent or an order for relief is entered with respect to the Trustee under any Bankruptcy Law;
- (3) a Custodian or other public officer takes charge of the Trustee or its property; or
- (4) the Trustee otherwise becomes incapable of acting.

If the Trustee resigns or is removed or if a vacancy exists in the office of Trustee with respect to any Series of Securities for any reason, the Company shall promptly notify each Holder of such event and shall promptly appoint a successor Trustee.

If a successor Trustee with respect to the Securities of one or more Series does not take office within 60 days after the retiring Trustee resigns or is removed, the retiring Trustee, the Company or the Holders of at least 10% in principal amount of the outstanding Securities of the

applicable Series may petition any court of competent jurisdiction for the appointment of a successor Trustee.

If the Trustee with respect to the Securities of one or more Series fails to comply with Section 7.10 hereof, any Securityholder of the applicable Series may petition any court of competent jurisdiction for the removal of the Trustee and the appointment of a successor Trustee.

A successor Trustee shall deliver a written acceptance of its appointment to the retiring Trustee and to the Company. Immediately following such delivery (i) the retiring Trustee with respect to one or more Series shall, subject to its rights under Section 7.7 hereof, transfer all property held by it as Trustee with respect to such Series to the successor Trustee, (ii) the resignation or removal of the retiring Trustee shall become effective, and (iii) the successor

Trustee with respect to such Series shall have all the rights, powers and duties of the Trustee under this Indenture. A successor Trustee with respect to the Securities of one or more Series shall mail notice of its succession to each Securityholder of such Series.

7.9 Successor Trustee by Consolidation, Merger or Conversion.

If the Trustee consolidates with, merges or converts into, or transfers all or substantially all of its corporate trust assets to, another corporation, subject to Section 7.10 hereof, the successor corporation without any further act shall be the successor Trustee.

7.10 Eligibility; Disqualification.

This Indenture shall always have a Trustee who satisfies the requirements of TIA Sections 310(a)(1), (2) and (5) in every respect. The Trustee shall have a combined capital and surplus of at least \$100,000,000 as set forth in its most recent published annual report of condition. The Trustee shall comply with TIA Section 310(b), including the provision in Section 310(b)(1). If at any time the Trustee shall cease to be eligible in accordance with the provisions of this Section 7.10, it shall resign immediately in the manner and with the effect specified in this Article 7.

7.11 Preferential Collection of Claims Against Company.

The Trustee shall comply with TIA Section 311(a), excluding any creditor relationship listed in TIA Section 311(b). A Trustee who has resigned or been removed shall be subject to TIA Section 311(a) to the extent indicated therein.

7.12 Paying Agents.

The Company shall cause each Paying Agent other than the Trustee to execute and deliver to it and the Trustee an instrument in which such agent shall agree with the Trustee, subject to the provisions of this Section 7.12:

(1) that it will hold all sums held by it as agent for the payment of principal of, or premium, if any, or interest on, the Securities (whether such sums have been paid to it by the Company or by any obligor on the Securities) in trust for the benefit of Holders of the Securities or the Trustee;

31

(2) that it will at any time during the continuance of any Event of Default, upon written request from the Trustee, deliver to the Trustee all sums so held in trust by it together with a full accounting thereof; and

(3) that it will give the Trustee written notice within three (3) Business Days of any failure of the Company (or by any obligor on the Securities) in the payment of any installment of the principal of, premium, if any, or interest on, the Securities when the same shall be due and payable.

ARTICLE 8

AMENDMENTS, SUPPLEMENTS AND WAIVERS

8.1 Without Consent of Holders.

The Company, when authorized by a Board Resolution, and the Trustee may amend or supplement this Indenture or the Securities of one or more Series without notice to or consent of any Securityholder:

- (1) to comply with Section 5.1 hereof;
- (2) to provide for uncertificated Securities in addition to certificated Securities;
- (3) to comply with any requirements of the SEC under the TIA;
- (4) to cure any ambiguity, defect or inconsistency, or to make any other change that does not adversely affect the rights of any Securityholder;
- (5) to provide for the issuance of and establish the form and terms and conditions of Securities of any Series as permitted by this Indenture; or
- (6) to evidence and provide for the acceptance of appointment hereunder by a successor Trustee with respect to the Securities of one or more Series and to add to or change any of the provisions of this Indenture as shall be necessary to provide for or facilitate the administration of the trusts hereunder by more than one Trustee.

The Trustee is hereby authorized to join with the Company in the execution of any supplemental indenture authorized or permitted by the terms of this Indenture and to make any further appropriate agreements and stipulations which may be therein contained, but the Trustee shall not be obligated to enter into any such supplemental indenture which adversely affects its own rights, duties or immunities under this Indenture.

8.2 With Consent of Holders.

(a) The Company, when authorized by a Board Resolution, and the Trustee may amend or supplement this Indenture or the Securities of one or more Series with the written consent of the Holders of not less than a majority in aggregate principal amount

32

of the outstanding Securities of such Series affected by such amendment or supplement without notice to any Securityholder. The Holders of not less than a majority in aggregate principal amount of the outstanding Securities of each such Series affected by such amendment or supplement may waive compliance in a particular instance by the Company with any provision of this Indenture or the Securities of such Series without notice to any Securityholder. Subject to Section 8.4, without the consent of each Securityholder affected, however, an amendment, supplement or waiver, including a waiver pursuant to Section 6.4, may not:

- (i) reduce the amount of Securities whose Holders must consent to an amendment, supplement or waiver to this Indenture or the Securities;
- (ii) reduce the rate of or change the time for payment of interest on any Security;
- (iii) reduce the principal or change the Stated Maturity of any Security or reduce the amount of, or postpone the date fixed for, the payment of any sinking fund or analogous obligation;
- (iv) make any Security payable in money other than that stated in the Security;
- (v) change the amount or time of any payment required by the Securities or reduce the premium payable upon any redemption of the Securities, or change the time before which no such redemption may be made;
- (vi) waive a Default or Event of Default in the payment of the principal of or interest or premium, if any, on any Security (except a rescission of acceleration of the Securities of any Series by the Holders of at least a majority in principal amount of the outstanding Securities of such Series and a waiver of the payment default that resulted from such acceleration);
- (vii) waive a redemption payment with respect to any Security or change any of the provisions with respect to the redemption of any Securities;
- (viii) make any changes in Sections 6.4 or 6.7 hereof or this Section 8.2, except to increase any percentage of Securities the Holders of which must consent to any matter; or
- (ix) take any other action otherwise prohibited by this Indenture to be taken without the consent of each holder affected thereby.

(b) Upon the request of the Company, accompanied by a Board Resolution authorizing the execution of any such supplemental indenture, and upon the receipt by the

33

Trustee of evidence reasonably satisfactory to the Trustee of the consent of the Securityholders as aforesaid and upon receipt by the Trustee of the documents described in Section 8.6 hereof, the Trustee shall join with the Company in the execution of such supplemental indenture unless such supplemental indenture affects the Trustee's own rights, duties or immunities under this Indenture, in which case the Trustee may in its discretion, but shall not be obligated to, enter into such supplemental indenture.

(c) It shall not be necessary for the consent of the Holders under this section to approve the particular form of any proposed amendment, supplement or waiver, but it shall be sufficient if such consent approves the substance thereof.

8.3 Compliance with Trust Indenture Act.

Every amendment to or supplement of this Indenture or the Securities shall comply with the TIA as then in effect.

8.4 Revocation and Effect of Consents.

Until an amendment, supplement, waiver or other action becomes effective, a consent to it by a Holder of a Security is a continuing consent conclusive and binding upon such Holder and every subsequent Holder of the same Security or portion thereof, and of any Security issued upon the transfer thereof or in exchange therefor or in place thereof, even if notation of the consent is not made on any such Security. Any such Holder or subsequent Holder, however, may revoke the consent as to his Security or portion of a Security, if the Trustee receives the notice of revocation before the date the amendment, supplement, waiver or other action becomes effective.

The Company may, but shall not be obligated to, fix a record date for the purpose of determining the Holders entitled to consent to any amendment, supplement, or waiver which record date shall be at least 30 days prior to the first solicitation of such consent. If a record date is fixed, then, notwithstanding the preceding paragraph, those Persons who were Holders at such record date (or their duly designated proxies), and only such Persons, shall be entitled to consent to such amendment, supplement, or waiver or to revoke any consent previously given, whether or not such Persons continue to be Holders after such record date. No such consent shall be valid or effective for more than 90 days after such record date without the applicable amendment, supplement or waiver becoming effective.

After an amendment, supplement, waiver or other action becomes effective, it shall bind every Securityholder, unless it makes a change described in any of clauses (1) through (9) of Section 8.2 hereof. In that case the amendment, supplement, waiver or other action shall bind each Holder of a Security who has consented to it and every subsequent Holder of a Security or portion of a Security that evidences the same debt as the consenting Holder's Security; provided that any such waiver shall not impair or affect the right of any Holder to receive payment of principal of and interest and premium (if any) on a Security, on or after the respective due dates expressed in such Security, or to bring suit for the enforcement of any such payment on or after such respective dates without the consent of such Holder.

34

8.5 Notation on or Exchange of Securities.

If an amendment, supplement, or waiver changes the terms of a Security of any Series, the Trustee may request the Holder of such Security to deliver it to the Trustee. In such case, the Trustee shall place an appropriate notation on such Security about the changed terms and return it to the Holder. Alternatively, if the Company or the Trustee so determines, the Company in exchange for such Security shall issue and the Trustee shall authenticate a new security that reflects the changed terms. Failure to make the appropriate notation or issue a new Security shall not affect the validity and effect of such amendment, supplement or waiver.

8.6 Trustee to Sign Amendments, Etc.

The Trustee shall sign any amendment, supplement or waiver authorized pursuant to this Article 8 if the amendment, supplement or waiver does not adversely affect the rights, duties, liabilities or immunities of the Trustee. If it does, the Trustee may, but need not, sign it. In signing or refusing to sign such amendment, supplement or waiver the Trustee shall be entitled to receive and, subject to Section 7.1 hereof, shall be fully protected in relying upon an Officers' Certificate and an Opinion of Counsel stating that such amendment, supplement or waiver is authorized or permitted by this Indenture. The Company may not sign an amendment or supplement until the Board of Directors of the Company approves it.

ARTICLE 9

DISCHARGE OF INDENTURE; DEFEASANCE

9.1 Discharge of Indenture.

The Company may terminate its obligations under the Securities of any Series and this Indenture with respect to such Series, except the obligations referred to in the last paragraph of this Section 9.1, if there shall have been canceled by the Trustee or delivered to the Trustee for cancellation all Securities of such Series theretofore authenticated and delivered (other than any Securities of such Series that are asserted to have been destroyed, lost or stolen and that shall have been replaced as provided in Section 2.8 hereof) and the Company has paid all sums payable by it hereunder or deposited all required sums with the Trustee.

After such delivery the Trustee upon request shall acknowledge in writing the discharge of the Company's obligations under the Securities of such Series and this Indenture except for those surviving obligations specified below.

Notwithstanding the satisfaction and discharge of this Indenture, the obligations of the Company in Sections 7.7, 9.5 and 9.6 hereof shall survive.

9.2 Legal Defeasance.

The Company may at its option, by Board Resolution, be discharged from its obligations with respect to the Securities of any Series on the date the conditions set forth in Section 9.4 below are satisfied (hereinafter, "*Legal Defeasance*"). For this purpose, such Legal Defeasance means that the Company shall be deemed to have paid and discharged the entire indebtedness

represented by the Securities of such Series and to have satisfied all its other obligations under such Securities and this Indenture insofar as such Securities are concerned (and the Trustee, at the expense of the Company, shall, subject to Section 9.6 hereof, execute proper instruments acknowledging the same), except for the following which shall survive until otherwise terminated or discharged hereunder: (A) the rights of Holders of outstanding Securities of such Series to receive solely from the trust funds described in Section 9.4 hereof and as more fully set forth in such section, payments in respect of the principal of, premium, if any, and interest on the Securities of such Series when such payments are due, (B) the Company's obligations with respect to the Securities of such Series under Sections 2.4, 2.5, 2.6, 2.7, 2.8 and 2.9 hereof, (C) the rights, powers, trusts, duties, and immunities of the Trustee hereunder (including claims of, or payments to, the Trustee under or pursuant to Section 7.7 hereof) and (D) this Article 9. Subject to compliance with this Article 9, the Company may exercise its option under this Section 9.2 with respect to the Securities of any Series notwithstanding the prior exercise of its option under Section 9.3 below with respect to the Securities of such Series.

9.3 Covenant Defeasance.

At the option of the Company, pursuant to a Board Resolution, the Company shall be released from its obligations under Sections 4.2 through 4.7 hereof, inclusive, and Section 5.1 hereof, with respect to the outstanding Securities of any Series, on and after the date the conditions set forth in Section 9.4 hereof are satisfied (hereinafter, "*Covenant Defeasance*"). For this purpose, such Covenant Defeasance means that the Company may omit to comply with and shall have no liability in respect of any term, condition or limitation set forth in any such specified section or portion thereof, whether directly or indirectly by reason of any reference elsewhere herein to any such specified Section or portion thereof or by reason of any reference in any such specified section or portion thereof to any other provision herein or in any other document, but the remainder of this Indenture and the Securities of any Series shall be unaffected thereby.

9.4 Conditions to Legal Defeasance or Covenant Defeasance.

The following shall be the conditions to application of Section 9.2 or Section 9.3 hereof to the outstanding Securities of a Series:

(1) the Company shall irrevocably have deposited or caused to be deposited with the Trustee (or another trustee satisfying the requirements of Section 7.10 hereof who shall agree to comply with the provisions of this Article 9 applicable to it) as funds in trust for the purpose of making the following payments, specifically pledged as security for, and dedicated solely to, the benefit of the Holders of the Securities, (A) money in an amount, or (B) U.S. Government Obligations or Foreign Government Obligations which through the scheduled payment of principal and interest in respect thereof in accordance with their terms will provide, not later than the due date of any payment, money in an amount, or (C) a combination thereof, sufficient, in the opinion of a nationally recognized firm of independent public accountants expressed in a written

Stated Maturity of such principal, premium, if any, or interest, or on dates for payment and redemption of such principal, premium, if any, and interest selected in accordance with the terms of this Indenture and of the Securities of such Series;

(2) no Event of Default or Default with respect to the Securities of such Series shall have occurred and be continuing on the date of such deposit, or shall have occurred and be continuing at any time during the period ending on the 91st day after the date of such deposit or, if longer, ending on the day following the expiration of the longest preference period under any Bankruptcy Law applicable to the Company in respect of such deposit (it being understood that this condition shall not be deemed satisfied until the expiration of such period);

(3) such Legal Defeasance or Covenant Defeasance shall not cause the Trustee to have a conflicting interest for purposes of the TIA with respect to any securities of the Company;

(4) such Legal Defeasance or Covenant Defeasance shall not result in a breach or violation of, or constitute default under any other agreement or instrument to which the Company is a party or by which it is bound;

(5) the Company shall have delivered to the Trustee an Opinion of Counsel stating that, as a result of such Legal Defeasance or Covenant Defeasance, neither the trust nor the Trustee will be required to register as an investment company under the Investment Company Act of 1940, as amended;

(6) in the case of an election under Section 9.2 above, the Company shall have delivered to the Trustee an Opinion of Counsel stating that (i) the Company has received from, or there has been published by, the Internal Revenue Service a ruling to the effect that or (ii) there has been a change in any applicable Federal income tax law with the effect that, and such opinion shall confirm that, the Holders of the outstanding Securities of such Series or persons in their positions will not recognize income, gain or loss for Federal income tax purposes solely as a result of such Legal Defeasance and will be subject to Federal income tax on the same amounts, in the same manner, including as a result of prepayment, and at the same times as would have been the case if such Legal Defeasance had not occurred;

(7) in the case of an election under Section 9.3 hereof, the Company shall have delivered to the Trustee an Opinion of Counsel to the effect that the Holders of the outstanding Securities of such Series will not recognize income, gain or loss for Federal income tax purposes as a result of such Covenant Defeasance and will be subject to Federal income tax on the same amounts, in the same manner and at the same times as would have been the case if such Covenant Defeasance had not occurred;

(8) the Company shall have delivered to the Trustee an Officers' Certificate and an Opinion of Counsel, each stating that all conditions precedent provided for in this Article 9 relating to either the Legal Defeasance under Section 9.2 above or the Covenant Defeasance under Section 9.3 hereof (as the case may be) have been complied with;

(9) the Company shall have delivered to the Trustee an Officers' Certificate stating that the deposit under clause (1) was not made by the Company with the intent of defeating, hindering, delaying or defrauding any creditors of the Company or others; and

(10) the Company shall have paid or duly provided for payment under terms mutually satisfactory to the Company and the Trustee all amounts then due to the Trustee pursuant to Section 7.7 hereof.

9.5 Deposited Money and U.S. and Foreign Government Obligations to be Held in Trust; Other Miscellaneous Provisions.

All money, U.S. Government Obligations and Foreign Government Obligations (including the proceeds thereof) deposited with the Trustee pursuant to Section 9.4 hereof in respect of the outstanding Securities shall be held in trust and applied by the Trustee, in accordance with the provisions of such Securities and this Indenture, to the payment, either directly or through any Paying Agent as the Trustee may determine, to the Holders of such Securities, of all sums due and to become due thereon in respect of principal, premium, if any, and accrued interest, but such money need not be segregated from other funds except to the extent required by law.

The Company shall pay and indemnify the Trustee against any tax, fee or other charge imposed on or assessed against the U.S. Government Obligations and Foreign Government Obligations deposited pursuant to Section 9.4 hereof or the principal, premium, if any, and interest received in respect thereof other than any such tax, fee or other charge which by law is for the account of the Holders of the outstanding Securities.

Anything in this Article 9 to the contrary notwithstanding, the Trustee shall deliver or pay to the Company from time to time upon Company Request any money, U.S. Government Obligations or Foreign Government Obligations held by it as provided in Section 9.4 hereof which, in the opinion of a nationally recognized firm of independent public accountants expressed in a written certification thereof delivered to the Trustee, are in excess of the amount thereof which would then be required to be deposited to effect an equivalent Legal Defeasance or Covenant Defeasance.

9.6 Reinstatement.

If the Trustee or Paying Agent is unable to apply any money, U.S. Government Obligations or Foreign Government Obligations in accordance with Section 9.1, 9.2, 9.3 or 9.4 hereof by reason of any legal proceeding or by reason of any order or judgment of any court or governmental authority enjoining, restraining or otherwise prohibiting such application, the Company's obligations under this Indenture and the Securities shall be revived and reinstated as though no deposit had occurred pursuant to this Article 9 until such time as the Trustee or Paying Agent is permitted to apply all such money, U.S. Government Obligations or Foreign Government Obligations, as the case may be, in accordance with Section 9.1, 9.2, 9.3 or 9.4 hereof; provided, however,

that if the Company has made any payment of principal of, premium, if any, or accrued interest on any Securities because of the reinstatement of their obligations, the Company shall be subrogated to the rights of the Holders of such Securities to receive such

payment from the money, U.S. Government Obligations or Foreign Government Obligations held by the Trustee or Paying Agent.

9.7 Moneys Held by Paying Agent.

In connection with the satisfaction and discharge of this Indenture, all moneys then held by any Paying Agent under the provisions of this Indenture shall, upon demand of the Company, be paid to the Trustee, or if sufficient moneys have been deposited pursuant to Section 9.1 hereof, to the Company, and thereupon such Paying Agent shall be released from all further liability with respect to such moneys.

9.8 Moneys Held by Trustee.

Any moneys deposited with the Trustee or any Paying Agent or then held by the Company in trust for the payment of the principal of, or premium, if any, or interest on any Security that are not applied but remain unclaimed by the Holder of such Security for two years after the date upon which the principal of, or premium, if any, or interest on such Security shall have respectively become due and payable shall be repaid to the Company upon Company Request, or if such moneys are then held by the Company in trust, such moneys shall be released from such trust; and the Holder of such Security entitled to receive such payment shall thereafter, as an unsecured general creditor, look only to the Company for the payment thereof, and all liability of the Trustee or such Paying Agent with respect to such trust money shall thereupon cease; provided, however, that the Trustee or any such Paying Agent, before being required to make any such repayment, may, at the expense of the Company, either mail to each Securityholder affected, at the address shown in the register of the Securities maintained by the Registrar or cause to be published once a week for two successive weeks, in a newspaper published in the English language, customarily published each Business Day and of general circulation in the City of New York, New York, a notice that such money remains unclaimed and that, after a date specified therein, which shall not be less than 30 days from the date of such mailing or publication, any unclaimed balance of such moneys then remaining will be repaid to the Company. After payment to the Company or the release of any money held in trust by the Company, Securityholders entitled to the money must look only to the Company for payment as general creditors unless applicable abandoned property law designates another person.

ARTICLE 10

MISCELLANEOUS

10.1 Trust Indenture Act Controls.

If any provision of this Indenture limits, qualifies or conflicts with another provision which is required to be included in this Indenture by the TIA, the required provision shall control. If any provision of this Indenture modifies or excludes any provision of the TIA which may be so modified or excluded, the latter provision shall be deemed to apply to this Indenture as so modified or to be excluded, as the case may be.

10.2 Notices.

Any notice or communication shall be given in writing and delivered in person, sent by facsimile, delivered by commercial courier service or mailed by first-class mail, postage prepaid, addressed as follows:

If to the Company:

Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, MA 01915
Attention: Lynnette C. Fallon

Copy to:

Locke Lord LLP
111 Huntington Avenue
Boston, Massachusetts 02199
Attention: Matthew C. Dallett

If to the Trustee:

The Company or the Trustee by written notice to the other may designate additional or different addresses for subsequent notices or communications. Any notice or communication to the Company or the Trustee shall be deemed to have been given or made as of the date so delivered if personally delivered; when answered back, if telexed; when receipt is acknowledged, if telecopied; and five (5) calendar days after mailing if sent by registered or certified mail, postage prepaid (except that a notice of change of address shall not be deemed to have been given until actually received by the addressee).

Any notice or communication mailed to a Securityholder shall be mailed to him by first-class mail, postage prepaid, at his address shown on the register kept by the Registrar. In addition, notices or communications to Securityholders shall be given by release made to Reuters Economic Services and

Failure to mail a notice or communication to a Securityholder or any defect in it shall not affect its sufficiency with respect to other Securityholders. If a notice or communication to a Securityholder is mailed in the manner provided above, it shall be deemed duly given five (5) calendar days after mailing, whether or not the addressee receives it.

In case by reason of the suspension of regular mail service, or by reason of any other cause, it shall be impossible to mail any notice as required by this Indenture, then such method of notification as shall be made with the approval of the Trustee shall constitute a sufficient mailing of such notice.

In the case of Global Securities, notices or communications to be given to Securityholders shall be given to the Depository, in accordance with its applicable policies as in effect from time to time.

10.3 Communications by Holders with Other Holders.

Securityholders of any Series may communicate pursuant to TIA Section 312(b) with other Securityholders of that Series or any other Series with respect to their rights under this Indenture or the Securities of that Series or any other Series. The Company, the Trustee, the Registrar and anyone else shall have the protection of TIA Section 312(c).

10.4 Certificate and Opinion as to Conditions Precedent.

Upon any request or application by the Company to the Trustee to take any action under this Indenture, the Company shall furnish to the Trustee:

- (1) an Officers' Certificate (which shall include the statements set forth in Section 10.5 below) stating that, in the opinion of the signers, all conditions precedent, if any, provided for in this Indenture relating to the proposed action have been complied with; and
- (2) an Opinion of Counsel (which shall include the statements set forth in Section 10.5 below) stating that, in the opinion of such counsel, all such conditions precedent have been complied with.

10.5 Statement Required in Certificate and Opinion.

Each certificate and opinion with respect to compliance with a condition or covenant provided for in this Indenture shall include:

- (1) a statement that the Person making such certificate or opinion has read such covenant or condition;
- (2) a brief statement as to the nature and scope of the examination or investigation upon which the statements or opinions contained in such certificate or opinion are based;
- (3) a statement that, in the opinion of such Person, it or he has made such examination or investigation as is necessary to enable it or him to express an informed opinion as to whether or not such covenant or condition has been complied with; and
- (4) a statement as to whether or not, in the opinion of such Person, such covenant or condition has been complied with.

10.6 Rules by Trustee and Agents.

The Trustee may make reasonable rules for action by or at meetings of Securityholders. The Registrar and Paying Agent may make reasonable rules for their functions.

10.7 Business Days; Legal Holidays.

If a payment date is not a Business Day at a place of payment, payment may be made at that place on the next succeeding day that is a Business Day, and no interest shall accrue for the intervening period with respect to such delay in payment.

10.8 Governing Law.

THIS INDENTURE AND THE SECURITIES SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, AS APPLIED TO CONTRACTS MADE AND PERFORMED WITHIN THE STATE OF NEW YORK (WITHOUT GIVING EFFECT TO ANY CONFLICT OF LAWS PRINCIPLES THAT WOULD REQUIRE APPLICATION OF THE LAWS OF ANOTHER JURISDICTION). EACH OF THE PARTIES HERETO AGREES TO SUBMIT TO THE JURISDICTION OF THE COURTS OF THE COMMONWEALTH OF MASSACHUSETTS IN ANY ACTION OR PROCEEDING ARISING OUT OF OR RELATING TO THIS INDENTURE OR THE SECURITIES.

10.9 No Adverse Interpretation of Other Agreements.

This Indenture may not be used to interpret another indenture, loan, security or debt agreement of the Company or any Subsidiary thereof. No such indenture, loan, security or debt agreement may be used to interpret this Indenture.

10.10 No Recourse Against Others.

A director, officer, employee, stockholder or incorporator, as such, of the Company shall not have any liability for any obligations of the Company under the Securities or the Indenture or for any claim based on, in respect of or by reason of such obligations or their creations. Each Securityholder by accepting a Security waives and releases all such liability. Such waiver and release are part of the consideration for the issuance of the Securities.

10.11 Successors and Assigns.

All agreements of the Company in this Indenture and the Securities shall bind its successors and assigns, whether so expressed or not. All agreements of the Trustee, any additional trustee and any Paying Agents in this Indenture shall bind their respective successors and assigns.

10.12 Multiple Counterparts.

The parties may sign multiple counterparts of this Indenture. Each signed counterpart shall be deemed an original, but all of them together represent one and the same agreement.

42

10.13 Table of Contents, Headings, Etc.

The table of contents, cross-reference sheet and headings of the Articles and Sections of this Indenture have been inserted for convenience of reference only, are not to be considered a part hereof, and shall in no way modify or restrict any of the terms or provisions hereof.

10.14 Separability.

Each provision of this Indenture shall be considered separable and if for any reason any provision which is not essential to the effectuation of the basic purpose of this Indenture or the Securities shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

10.15 Securities in a Foreign Currency or in Euro.

Unless otherwise specified in a Board Resolution, a supplemental indenture hereto or an Officers' Certificate delivered pursuant to Section 2.2 of this Indenture with respect to a particular Series of Securities, whenever for purposes of this Indenture any action may be taken by the Holders of a specified percentage in aggregate principal amount of Securities of all Series or all Series affected by a particular action at the time outstanding and, at such time, there are outstanding Securities of any Series which are denominated in a coin or currency other than Dollars (including Euros), then the principal amount of Securities of such Series which shall be deemed to be outstanding for the purpose of taking such action shall be that amount of Dollars that could be obtained for such amount at the Market Exchange Rate at such time. For purposes of this Section 10.16, "Market Exchange Rate" shall mean the noon Dollar buying rate in New York City for cable transfers of that currency as published by the Federal Reserve Bank of New York; provided, however, in the case of Euros, Market Exchange Rate shall mean the rate of exchange determined by the Commission of the European Union (or any successor thereto) as published in the Official Journal of the European Union (such publication or any successor publication, the "Journal"). If such Market Exchange Rate is not available for any reason with respect to such currency, the Trustee shall use, in its sole discretion and without liability on its part, such quotation of the Federal Reserve Bank of New York or, in the case of Euros, the rate of exchange as published in the Journal, as of the most recent available date, or quotations or, in the case of Euros, rates of exchange from one or more major banks in The City of New York or in the country of issue of the currency in question or, in the case of Euros, in Luxembourg or such other quotations or, in the case of Euros, rates of exchange as the Trustee, upon consultation with the Company, shall deem appropriate. The provisions of this paragraph shall apply in determining the equivalent principal amount in respect of Securities of a Series denominated in currency other than Dollars in connection with any action taken by Holders of Securities pursuant to the terms of this Indenture.

All decisions and determinations of the Trustee regarding the Market Exchange Rate or any alternative determination provided for in the preceding paragraph shall be in its sole discretion and shall, in the absence of manifest error, be conclusive to the extent permitted by law for all purposes and irrevocably binding upon the Company and all Holders.

43

10.16 Judgment Currency.

The Company agrees, to the fullest extent that it may effectively do so under applicable law, that (a) if for the purpose of obtaining judgment in any court it is necessary to convert the sum due in respect of the principal of or interest or premium (if any) or other amount on the Securities of any Series (the "Required Currency") into a currency in which a judgment will be rendered (the "Judgment Currency"), the rate of exchange used shall be the rate at which in accordance with normal banking procedures the Trustee could purchase in The City of New York the Required Currency with the Judgment Currency on the day on which final unappealable judgment is entered, unless such day is not a New York Banking Day, then, the rate of exchange used shall be the rate at which in accordance with normal banking procedures the Trustee could purchase in The City of New York the Required Currency with the Judgment Currency on the New York Banking Day preceding the day on which final unappealable judgment is entered and (b) its obligations under this Indenture to make payments in the Required Currency (i) shall not be discharged or satisfied by any tender, any recovery pursuant to any judgment (whether or not entered in accordance with subsection (a)), in any currency other than the Required Currency, except to the extent that such tender or recovery shall result in the actual receipt, by the payee, of the full amount of the Required Currency expressed to be payable in respect of such payments, (ii) shall be enforceable as an alternative or additional cause of action for the purpose of recovering in the Required Currency the amount, if any, by which such actual receipt shall fall short of the full amount of the Required Currency so expressed to be payable, and (iii) shall not be affected by judgment being obtained for any other sum due under this Indenture. For purposes of the foregoing, "New York Banking Day" means any day except a Saturday, Sunday or a legal holiday in The City of New York on which banking institutions are authorized or required by law, regulation or executive order to close.

[Remainder of Page Intentionally Left Blank]

44

This instrument may be executed in any number of counterparts, each of which so executed shall be deemed to be an original, but all such counterparts shall together constitute but one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Indenture to be duly executed as of the day and year first above written.

AXCELIS TECHNOLOGIES, INC.

By: _____
Name:
Title:

[Name of Trustee]

By: _____
Name:
Title:



April 7, 2017

Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, MA 01915

Ladies and Gentlemen:

We are furnishing this opinion in connection with the Registration Statement on Form S-3 (the "Registration Statement") of Axcelis Technologies, Inc. (the "Company"), a Delaware corporation, to be filed on or about the date hereof with the U.S. Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act").

We have reviewed the Registration Statement, including the prospectus (the "Prospectus") that is a part of the Registration Statement. The Prospectus provides that it will be supplemented in the future by one or more supplements to the Prospectus (each a "Prospectus Supplement"). The Prospectus, as supplemented by various Prospectus Supplements, will provide for the issuance and sale by the Company of up to \$75,000,000 aggregate offering price of (i) one or more series of debt securities (the "Debt Securities"), (ii) shares of preferred stock, \$0.001 par value (the "Preferred Stock"), (iii) shares of common stock, \$0.001 par value (the "Common Stock"), (iv) warrants to purchase Common Stock, Preferred Stock or Debt Securities (collectively, the "Warrants"), and (v) units comprised of one or more Debt Securities, shares of Preferred Stock, shares of Common Stock and Warrants, in any combination (collectively, the "Units"). The Debt Securities, the Preferred Stock, the Common Stock, the Warrants, and the Units are collectively referred to herein as the "Securities." The Registration Statement provides that Debt Securities may be convertible into shares of Common Stock or shares of Preferred Stock, and that shares of Preferred Stock may be convertible into shares of Common Stock.

The Debt Securities will be issued pursuant to one or more indentures in the form filed as an exhibit to the Registration Statement, as amended or supplemented from time to time (each, an "Indenture"), between the Company, as obligor, and a trustee chosen by the Company and qualified to act as such under the Trust Indenture Act of 1939, as amended (each, a "Trustee"). The Warrants will be issued under one or more warrant agreements (each, a "Warrant Agreement") by and among the Company and a financial institution identified therein as warrant agent (each, a "Warrant Agent"). The Units will be issued under one or more unit agreements (each, a "Unit Agreement") between the Company and a unit agent selected by the Company (the "Unit Agent").

Atlanta | Austin | Boston | Chicago | Cincinnati | Dallas | Hartford | Hong Kong | Houston | London | Los Angeles | Miami
Morristown | New Orleans | New York | Providence | Sacramento | San Francisco | Stamford | Washington DC | West Palm Beach

The Prospectus as supplemented by various Prospectus Supplements will provide for the issuance and sale by the Company of the Securities, which are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act.

We have acted as your counsel in connection with the preparation of the Registration Statement and are familiar with certain proceedings taken and proposed to be taken by the Company in connection with the authorization and issuance of the Securities. We have made such examination as we consider necessary to render this opinion.

The opinions expressed below are limited to the Delaware General Corporation Law, the laws of the State of New York and the federal laws of the United States.

We assume for purposes of this opinion that (i) the Company is and will remain duly organized, validly existing and in good standing under Delaware law and (ii) the Registration Statement and any required post-effective amendments thereto will have all become effective under the Securities Act.

Based upon the foregoing, we are of the opinion that:

1. When the Company and the Trustee duly execute and deliver an Indenture and the specific terms of a particular Debt Security have been duly established in accordance with the terms of such Indenture, and such Debt Securities have been duly executed and delivered on behalf of the Company and duly authenticated by the Trustee against payment therefor in accordance with the terms and provisions of the Indenture and as contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s), and assuming that (a) the Indenture and all amendments thereto and the particular Debt Securities are duly approved by the Board of Directors of the Company as required by applicable law, (b) the terms of the Debt Securities as executed and delivered are as described in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), (c) the Debt Securities as executed and delivered do not violate any law applicable to the Company or result in a default under or breach of any agreement or instrument binding upon the Company, (d) the Debt Securities as executed and delivered comply with all requirements and restrictions, if any, applicable to the Company, whether imposed by any court or governmental or regulatory body having jurisdiction over the Company, and (e) the Debt Securities are then issued and sold as contemplated in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), the Debt Securities will constitute valid and binding obligations of the Company, enforceable against the Company in accordance with the terms of the Debt Securities.
2. The Company has pursuant to its Amended and Restated Certificate of Incorporation, as amended and supplemented to date (the "Restated Certificate"), 30,000,000 authorized shares of Preferred Stock. When a series of Preferred Stock has been duly established in accordance with the terms of the Restated Certificate and applicable law, and upon adoption by the Board of Directors of the Company of a resolution in form and content for the issuance of such series of shares as required by applicable law and upon issuance and delivery of and payment for such shares in the manner contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s)

and by such resolution, such shares of such series of Preferred Stock, assuming the availability of a sufficient number of authorized shares of such series pursuant to the Restated Certificate, will be validly issued, fully paid and nonassessable.

3. The Company has pursuant to the Restated Certificate 75,000,000 authorized shares of Common Stock. Upon adoption by the Board of Directors of the Company of a resolution for the issuance of shares of Common Stock in form and content as required by applicable law and upon issuance and delivery of and payment for such shares in the manner contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s) and by such resolution, such shares of Common Stock, assuming availability of a sufficient number of authorized shares pursuant to the Restated Certificate, will be validly issued, fully paid and nonassessable.
4. When the Company and the Warrant Agent duly execute and deliver a Warrant Agreement and the specific terms of a particular Warrant have been duly established in accordance with the terms of such Warrant Agreement, and such Warrants have been duly executed and delivered on behalf of the Company and duly authenticated by the Warrant Agent against payment therefor in accordance with the terms and provisions of the Warrant Agreement as contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s), and assuming that (a) the Warrant Agreement and all amendments thereto and the particular Warrants are duly approved by the Board of Directors of the Company as required by applicable law, (b) the terms of the Warrants as executed and delivered are as described in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), (c) the Warrants as executed and delivered do not violate any law applicable to the Company or result in a default under or breach of any agreement or instrument binding upon the Company, (d) the Warrants as executed and delivered comply with all requirements and restrictions, if any, applicable to the Company, whether imposed by any court or governmental or regulatory body having jurisdiction over the Company, and (e) the Warrants are then issued and sold as contemplated in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), the Warrants will constitute valid and binding obligations of the Company, enforceable against the Company in accordance with their terms.
5. When the Company and the Unit Agent duly execute and deliver a Unit Agreement and the specific terms of a particular Unit have been duly established in accordance with the terms of such Unit Agreement, and such Units have been duly executed and delivered on behalf of the Company and duly authenticated by the Unit Agent against payment therefor in accordance with the terms and provisions of the Unit Agreement and as contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s), and assuming that (a) the Unit Agreement and all amendments thereto and the particular Units are duly approved by the Board of Directors of the Company as required by applicable law, (b) the terms of the Units as executed and delivered are as described in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), (c) the Units as executed and delivered do not violate any law applicable to the Company or result in a default under or breach of any agreement or instrument binding upon the Company, (d) the Units as executed and delivered comply with all requirements and restrictions, if any, applicable to the Company, whether imposed by any court or governmental or regulatory body having jurisdiction over the Company, and

(e) the Units are then issued and sold as contemplated in the Registration Statement, the Prospectus and the related Prospectus Supplement(s), the Units will constitute valid and binding obligations of the Company, enforceable against the Company in accordance with their terms.

The foregoing opinions are subject to: (i) the effect of bankruptcy, insolvency, reorganization, fraudulent conveyance, moratorium or other similar laws now or hereafter in effect relating to or affecting the rights and remedies of creditors; (ii) general principles of equity (whether considered in a proceeding in equity or at law); and (iii) the unenforceability under certain circumstances under law or court decisions of provisions providing for the indemnification of, or contribution to, a party with respect to a liability where such indemnification or contribution is contrary to public policy. We express no opinion concerning the enforceability of any waiver of rights or defenses with respect to stay, extension or usury laws, and we express no opinion with respect to whether acceleration of Debt Securities may affect the collectibility of any portion of the stated principal amount thereof which might be determined to constitute unearned interest thereon.

To the extent that the obligations of the Company under an Indenture may be dependent thereon, we assume for purposes of this opinion that the Company has the organizational power and authority to issue and sell the Securities; that the applicable Indenture has been duly authorized by all necessary organizational action by the Company, has been duly executed and delivered by the Company and constitutes the valid, binding and enforceable obligation of the Company enforceable against the Company in accordance with its terms; that the Trustee for each Indenture is duly organized, validly existing and in good standing under the laws of its jurisdiction of organization; that the Trustee is duly qualified to engage in the activities contemplated by the applicable Indenture; that the applicable Indenture has been duly authorized, executed and delivered by the Trustee and constitutes a legally valid, binding and enforceable obligation of the Trustee, enforceable against the Trustee in accordance with its terms; that the Trustee is in compliance, generally and with respect to acting as Trustee under the applicable Indenture, with all applicable laws and regulations; and that the Trustee has the requisite organizational and legal power and authority to perform its obligations under the applicable Indenture.

To the extent that the obligations of the Company under each Warrant Agreement or Unit Agreement, as applicable, may be dependent thereon, we assume for purposes of this opinion that the Company has the corporate power and authority to issue and sell the Securities; that the applicable Warrant Agreement or Unit Agreement has been duly authorized by all necessary corporate action by the Company, has been duly executed and delivered by the Company and constitutes the valid, binding and enforceable obligation of the Company enforceable against the Company in accordance with its terms; that the applicable Warrant Agent or Unit Agent is duly organized, validly existing and in good standing under the laws of its jurisdiction of organization; that the Warrant Agent or Unit Agent is duly qualified to engage in the activities contemplated by the Warrant Agreement or Unit Agreement; that the Warrant Agreement or Unit Agreement has been duly authorized, executed and delivered by the Warrant Agent or Unit Agent and constitutes the legally valid, binding and enforceable obligation of the Warrant Agent or Unit Agent, enforceable against the Warrant Agent or Unit Agent in accordance with its terms; that the Warrant Agent or Unit Agent is in compliance, generally and with respect to acting as a Warrant Agent or Unit Agent under the applicable Warrant Agreement or Unit Agreement, with

all applicable laws and regulations; and that the Warrant Agent or Unit Agent has the requisite organizational and legal power and authority to perform its obligations under the applicable Warrant Agreement or Unit Agreement.

We consent to your filing this opinion as an exhibit to the Registration Statement and to the reference to our firm under the caption “Legal Matters” in the Prospectus included therein. In giving such consent, we do not thereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act, or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Locke Lord LLP

COMPUTATION OF RATIO OF EARNINGS TO FIXED CHARGES

The following table sets forth Axcelis Technologies, Inc.'s ratio of earnings to fixed charges for the periods indicated.

| (dollars in thousands) | YEARS ENDED DECEMBER 31, | | | | |
|---|--------------------------|-------------|-------------|-----------|-----------|
| | 2012 | 2013 | 2014 | 2015 | 2016 |
| Pretax income (loss) from continuing operations | \$ (32,388) | \$ (16,104) | \$ (10,167) | \$ 15,205 | \$ 11,024 |
| Fixed charges: | | | | | |
| Interest expense | \$ — | \$ 457 | \$ 1,069 | \$ 4,976 | \$ 5,073 |
| Amortized expenses related to indebtedness | \$ — | \$ 35 | \$ 114 | \$ 170 | \$ 73 |
| Interest portion of rental expense | \$ 215 | \$ 200 | \$ 185 | \$ 190 | \$ 190 |
| Total fixed charges | \$ 215 | \$ 692 | \$ 1,368 | \$ 5,336 | \$ 5,336 |
| Amortization of capitalized interest | \$ 54 | \$ 54 | \$ 54 | \$ 54 | \$ 54 |
| Earnings | \$ (32,119) | \$ (15,358) | \$ (8,745) | \$ 20,595 | \$ 16,414 |
| Ratio of earnings to fixed charges(A) | (B) | (B) | (B) | 3.9 | 3.1 |

(A) The ratio of earnings to fixed charges is defined as earnings divided by fixed charges. For purposes of this ratio, earnings is defined as net income (loss) from continuing operations plus fixed charges. "Fixed charges" means the sum of interest expense and an estimate of the interest portion of rental expense under operating leases. Interest expense on uncertain tax positions is included in the Ratio of Earnings to Fixed Charges.

(B) For the years ended December 31, 2012, 2013, and 2014, earnings were insufficient to cover fixed charges and therefore our coverage deficiency was \$32.1 million, \$15.4 million, and \$8.7 million, respectively.

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” in this Registration Statement (Form S-3) and related Prospectus of Axcelis Technologies, Inc. for the registration of common stock, preferred stock, warrants, debt securities, and units, and to the incorporation by reference therein of our report dated March 14, 2017, with respect to the consolidated financial statements and schedule of Axcelis Technologies, Inc., and the effectiveness of internal control over financial reporting of Axcelis Technologies, Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2016, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts

April 7, 2017
