

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT

**Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934**

Date of Report (Date of earliest event reported): **January 15, 2009**

Axcelis Technologies, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation)

000-30941
(Commission
File Number)

34-1818596
(IRS Employer
Identification No.)

108 Cherry Hill Drive, Beverly, Massachusetts
(Address of principal executive offices)

01915
(Zip Code)

Registrant's telephone number, including area code: **(978) 787-4000**

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 2.04 Triggering Events that Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-balance Sheet Arrangement.

Axcelis Technologies, Inc. (the "Company" or "Axcelis") and U.S. Bank National Association, as trustee (the "Trustee"), are parties to an Indenture dated as of May 2, 2006 (the "Indenture") relating to the Company's 4.25% Convertible Senior Subordinated Notes (the "Senior Subordinated Notes"). Under the Indenture, the Company is required to repay the outstanding principal amount of the Senior Subordinated Notes plus a maturity premium and accrued interest (a total payment of approximately \$85 million) on January 15, 2009. A copy of the Indenture was included as Exhibit 4.12 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 4, 2006.

On January 15, 2009, Axcelis failed to make the required payment under the Indenture. Such failure constitutes an event of default under the Indenture. Pursuant to the Indenture and as a result of the failure by Axcelis to make the required payment, Axcelis is required to pay, upon demand of the Trustee, the entire overdue amount, plus interest at a rate of 8.0% per annum, plus certain additional costs and expenses associated with the collection of such amounts. Axcelis is actively engaged in discussions with the sole holder of the Senior Subordinated Notes (the "Holder"). Axcelis will continue to seek a waiver and forbearance or longer term refinancing from the Holder, but also continues to be engaged in seeking other sources of financing and other liquidity initiatives. There can be no assurance that the Company's efforts will be successful or that the Holder or Trustee will not declare all outstanding obligations under the Indenture to be immediately due and payable and pursue their rights and remedies under the Indenture.

Item 7.01 Regulation FD Disclosure

On January 15, 2009, the Company issued a press release disclosing the failure to make the required payment under the Indenture and related issues. A copy of the Company's press release is furnished with this Current Report on Form 8-K as Exhibit 99.1 and incorporated herein by reference.

SIGNATURE

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

By: /s/ STEPHEN G. BASSETT

Stephen G. Bassett
Executive Vice President
and Chief Financial Officer

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Exhibit No.

Exhibit Index

99.1 Axcelis Technologies, Inc. press release dated January 15, 2009

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**AXCELIS PROVIDES UPDATE ON CONVERTIBLE SENIOR SUBORDINATED
NOTES, FINANCING AND STRATEGIC ALTERNATIVES**

BEVERLY, Mass., January 15, 2009 (GLOBAL NEWSWIRE) — Axcelis Technologies, Inc. (Nasdaq: ACLS) today announced that it is continuing to engage in negotiations on financing and strategic alternatives that will serve the best interests of the company following a missed payment on Convertible Senior Subordinated Notes that was due on January 15, 2009. The payment consisted of the outstanding principal on \$75 million of 4.25% Convertible Senior Subordinated Notes plus a maturity premium of 11.125% and accrued interest for a total of approximately \$85 million. As such, Axcelis is continuing discussions with its note holder as well as other lenders.

Axcelis emphasized that it is highly focused on preserving the company's financial health, including aggressively reducing expenses.

Like a number of companies impacted by the freeze up in the global credit markets, Axcelis has been hindered in the refinancing of its debt. Axcelis' efforts in this regard also have been impacted by the protracted decline in the semiconductor industry and the discussions with Sumitomo Heavy Industries, Ltd. regarding an acquisition of Axcelis last year, among other factors.

More information can be found in the Form 8-K that Axcelis filed with the Securities and Exchange Commission at www.sec.gov.

About Axcelis Technologies, Inc.

Axcelis Technologies, Inc., headquartered in Beverly, Massachusetts, provides innovative, high-productivity solutions for the semiconductor industry. Axcelis is dedicated to developing enabling process applications through the design, manufacture and complete life cycle support of ion implantation and cleaning systems. Axcelis also licenses its 50% owned joint venture, SEN Corporation, an SHI and Axcelis Company, to manufacture and sell certain implant products in Japan. The company's Internet address is: <http://www.axcelis.com>.
