

**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): **March 5, 2012**

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 1.01 Entry into a Material Definitive Agreement.

On March 5, 2012, Axcelis Technologies, Inc. and its wholly owned subsidiary, Axcelis Technologies CCS Corporation (collectively, "Axcelis" or the "Company"), agreed to further modify the terms of the Company's Second Amended and Restated Loan and Security Agreement dated April 25, 2011 (the "Revolving Credit Facility") with Silicon Valley Bank ("SVB") by entering into the Second Loan Modification Agreement dated as of March 5, 2012 (the "Second Modification Agreement"). The Company's subsidiaries that guaranty the Revolving Credit Facility, Fusion Technology International, Inc., Fusion Investments, Inc., High Temperature Engineering Corporation and Axcelis Technologies (Israel), Inc., ratified their Guarantys in connection with the Second Modification Agreement.

In addition to certain immaterial changes, the Second Modification Agreement revises the Company's covenants regarding its Adjusted Quick Ratio and minimum trailing six month Adjusted Net Income (as such capitalized terms are defined in the agreement) to conform to the Company's current forecasts.

All other material terms of the Revolving Credit Facility are unaffected by the Second Loan Modification Agreement.

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.

Date: March 6, 2012

Axcelis Technologies, Inc.

By: /s/ JAY ZAGER
Jay Zager
Executive Vice President
and Chief Financial Officer