

Securities and Exchange Commission, Washington, D.C. 20549

Schedule 13D

Under the Securities Exchange Act of 1934

Axcelis Technologies Inc.

(Name of Issuer)

Common Stock (\$.001 par value)

(Title of Class of Securities)

054540109

(CUSIP Number)

Kenneth R. Cotner

Sterling Capital Management LLC

4064 Colony Road, Suite 300

Charlotte, NC 28211

704-372-8670

(Name, Address and Telephone Number of Person Authorized to Receive Notices and Communications)

December 22, 2008

(Date of Event Which Requires Filing of This Statement) (Title of Class of Securities)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition that is the subject of this Schedule 13D, and is filing this schedule because of ??240.13d-1(e), 240.13d-1(f) or 240.13d-1(g), check the following box. X

Note: Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See Rule 13d-7 for other parties to whom copies are to be sent.

\*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

CUSIP No. 054540109

(1) Names of reporting persons.

Sterling Capital Management

42-1658828

(2) Check the appropriate box if a member of a group

(a)

(b)

(3) SEC use only

(4) Source of funds (see instructions)

00. Funds of investment advisory clients.

(5) Check if disclosure of legal proceedings is required pursuant to Items 2(d) or 2(e).

Not applicable.

(6) Citizenship or place of organization

North Carolina

Number of shares beneficially owned by each reporting person with:

(7) Sole voting power

10,999,509 shares

(8) Shared voting power

None

(9) Sole dispositive power

10,999,509 shares

(10) Shared dispositive power

None

(11) Aggregate amount beneficially owned by each reporting person

10,999,509 shares

(12) Check if the aggregate amount in Row (11) excludes certain shares (see instructions).

Not applicable

(13) Percent of class represented by amount in Row (11)  
10.7%

(14) Type of reporting person (see instructions)  
IA

Item 1. Security and Issuer.

This Schedule 13D relates to the common stock, \$.001 par value (the "Securities"), of Axcelis Technologies Inc. (the "Issuer"). The principal executive office of the Issuer is located at 108 Cherry Hill Drive; Beverly, MA 01915.

Item 2. Identity and Background.

(a), (b), (c) and (f). This statement is being filed by Sterling Capital Management LLC ("Sterling").

Sterling is an investment adviser registered with the Securities & Exchange Commission under the Investment Advisers Act of 1940. The address of its principal office is 4064 Colony Road, Suite 300, Charlotte, NC 28211. Sterling serves as an investment adviser to individual and institutional clients. The Securities of the Issuer reported in Item 5 were acquired on behalf of the investment advisory clients of Sterling, under discretionary authority granted to Sterling.

(d) and (e). None of the entities or persons identified in this Item 2 has during the past five years been convicted in any criminal proceeding, nor been a party to a civil proceeding of a judicial or administrative body of competent jurisdiction and as a result of such proceeding was or is subject to a judgment, decree or final order enjoining future violations of, or prohibiting or mandating activities subject to, federal or state securities laws or finding any violation with respect to such laws.

Item 3. Source and Amount of Funds or Other Consideration.

The respective investment advisory clients of Sterling used approximately \$49,308,289 in the aggregate to purchase the Securities reported in this filing. All assets used to purchase Securities were assets of these respective clients and none were assets of Sterling. In addition, none of the proceeds used to purchase the Securities were provided through borrowings of any nature.

Item 4. Purpose of Transaction.

We believe that Axcelis management is making good progress in addressing the company's short term financing issues. Further, the recently announced restructuring effort should assist the company in weathering an environment of continued weak spending. However, given the highly cyclical nature of the semiconductor capital equipment market, it is imperative that management actively explore all opportunities to better position Axcelis for long term success and creation of shareholder value. As such, Sterling Capital has communicated to management of Axcelis a concept of separating its systems business from the more stable aftermarket business. In addition to separating cyclical from non-cyclical businesses, this initiative would allow for efficient utilization of the cash currently residing on SEN's balance sheet and the tax benefits associated with extensive NOLs at Axcelis.

The Securities reported in this filing have been acquired for investment purposes on behalf of client accounts over which Sterling has discretionary investment authority.

In pursuing such investment purposes, Sterling may further purchase, hold, vote, trade, dispose or otherwise deal in the Securities at times, and in such manner, as they deem advisable to benefit from changes in market prices of such Securities, changes in the Issuer's operations, business strategy or prospects, or from sale or merger of the Issuer. To evaluate such alternatives, Sterling will routinely monitor the Issuer's operations, prospects, business development, management, competitive and strategic matters, capital structure, and prevailing market conditions, as well as alternative investment opportunities and other investment considerations. Consistent with its investment research methods and evaluation criteria, Sterling may discuss such matters with management or directors of the Issuer, other shareholders, industry analysts, existing or potential strategic partners or competitors, investment and financing professionals, sources of credit and other investors. Such factors and discussions may materially affect, and result in, Sterling modifying its clients' ownership of the Securities, exchanging information with the Issuer pursuant to appropriate confidentiality or similar agreements, proposing changes in the Issuer's operations, governance or capitalization, or in proposing one or more of the other actions described in subsections (a) through (j) of Item 4 of Schedule

Transactions shown below primarily resulted from cash flows within client portfolios. Generally, Sterling responds to such flows by executing transactions to maintain holdings at approximately the same percentages of the portfolio as prior to the cash flow.

Sterling reserves the right to formulate other plans and/or make other proposals, and take such actions with respect to their investment in the Issuer, including any or all of the actions set forth in paragraphs (a) through (j) of Item 4 of Schedule 13D.

Item 5. Interest in Securities of the Issuer.

(a) and (b). The aggregate number and percentage of Securities to which this Schedule 13D relates is 10,999,509 shares of the common stock of the Issuer, constituting approximately 10.7% of the 103,049,301 shares outstanding.

(c). The following transactions in the Issuer's Securities were effected by Sterling during the sixty days preceding the date of this report. On certain days, multiple transactions may have been executed at different times. The data below include the total shares and average price for all buy or sell transactions effected for each day. All such transactions represent open market transactions.

Transaction	Trade Date	Shares	Average Price
Buy	10/23/2008	93,600	\$0.52
Buy	10/24/2008	35,300	\$0.49
Buy	11/07/2008	28,700	\$0.74
Buy	11/10/2008	255,147	\$0.69
Buy	11/11/2008	74,853	\$0.64
Buy	11/21/2008	4,750	\$0.53
Buy	11/25/2008	170,400	\$0.50
Buy	11/26/2008	203,200	\$0.52
Buy	11/28/2008	57,200	\$0.60
Buy	12/01/2008	90,462	\$0.55
Buy	12/02/2008	111,200	\$0.54
Buy	12/03/2008	79,603	\$0.55
Buy	12/04/2008	85,860	\$0.55
Buy	12/09/2008	4,100	\$0.49
Buy	12/12/2008	72,100	\$0.46
Buy	12/15/2008	112,000	\$0.49
Buy	12/16/2008	198,900	\$0.53
Buy	12/17/2008	179,400	\$0.64
Buy	12/18/2008	202,100	\$0.57
Buy	12/19/2008	78,700	\$0.64
Sell	11/04/2008	8,250	\$0.51
Sell	11/05/2008	338,600	\$0.48
Sell	11/10/2008	343,000	\$0.65
Sell	11/11/2008	237,400	\$0.62
Sell	11/14/2008	1,800	\$0.63
Sell	11/19/2008	1,500	\$0.68
Sell	11/24/2008	1,400	\$0.54
Sell	11/28/2008	2,345	\$0.57
Sell	12/08/2008	2,500	\$0.45
Sell	12/10/2008	7,950	\$0.45
Sell	12/17/2008	5,450	\$0.56
Sell	12/18/2008	18,400	\$0.55
Sell	12/19/2008	2,250	\$0.58

(d). The investment advisory clients of Sterling have the sole right to receive and, subject to notice, to withdraw the proceeds from the sale of the Securities. Such clients may also terminate the investment advisory agreements without penalty upon appropriate notice.

(e). Not applicable.

Item 6. Contracts, Arrangements, Understandings or Relationships With Respect to Securities of the Issuer.

The powers of disposition with respect to Securities owned by discretionary accounts of Sterling are established in written investment advisory agreements between clients and Sterling, which are entered into in the normal and usual course of the business of Sterling as a registered investment adviser and which are generally applicable to all securities purchased for the benefit of each such discretionary account. There are no special or different agreements relating to the Securities of the Issuer.

The written investment advisory agreements with clients do not contain provisions relating to borrowing of funds to finance the acquisition of the Securities, acquisition of control, transfer of securities, joint ventures, or any of the other transactions listed in the instructions to Item 7 of Schedule 13D other than voting of proxies. In connection with voting, Sterling may be allowed or directed to vote the proxies received by discretionary accounts.

Signature.

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Date: December 22, 2008

STERLING CAPITAL MANAGEMENT LLC

By /s/ Brian R. Walton

---

Brian R. Walton  
Managing Director

December 15, 2008

Ms. Mary Puma  
Chairman and CEO  
Axcelis Technologies, Inc.  
108 Cherry Hill Drive  
Beverly, MA 01915-1053

Dear Mary,

These are certainly unprecedented times which we all are trying to navigate through. We appreciate the focus and effort the entire team at Axcelis has demonstrated during the current environment. However, given the challenges facing the company, we would strongly encourage Axcelis to embrace an altered strategy which would produce both immediate and long term value for all constituents.

The initiative described below attempts to utilize all of the many resources and assets that Axcelis claims which clearly are not being recognized by the public markets. Further, we believe that the ultimate corporate structure it defines provides a more appropriate division between cyclical and stable businesses.

Please consider:

o In March of 2008 SHI made an offer to purchase all of Axcelis' outstanding shares for \$6 per share or approximately \$618 million dollars. Combined with debt on the balance sheet of Axcelis the total offer equated to \$700 million. Through direct conversations with SHI and public documents it was clear that the motive behind this transaction was to consolidate the ion implant business of both Axcelis and SEN. Such a combination would yield significant cost synergies as well as enhanced product offerings.

The plan outlined below would allow SHI to achieve their initial goal, resolve short and long term financial challenges at Axcelis, and importantly create significant value for shareholders.

o Axcelis sells its implant/ dry strip systems business along with its 50% interest in SEN to SHI for \$136 million. This figure approximates the book value of the SEN investment on Axcelis' balance sheet. Importantly, such a price tag would require minimal net cash outlays by SHI as this transaction would give them immediate access to the entire \$140 million of net cash currently on the books at SEN. SHI would have the ability to merge these operations and garner the synergies available.

o Axcelis Corporation would become solely focused on the aftermarket business which would include exclusive rights for SEN/Axcelis legacy accounts. The aftermarket business generates approximately \$120 million in annual revenue and claims gross margins in excess of 50%. If properly sized such a business should be able to produce operating margins near the 20% level.

o Axcelis would retain existing NOLs which total \$150 million and could then be applied to the operating profits generated by the aftermarket business. These NOLs could be fully utilized as no change of control event would be triggered.

o After repayment of the \$85 million of debt the newly restructured Axcelis would have net cash of approximately \$100 million. Given the low capital intensity of the aftermarket business and its relative stability, at least \$50 million of this cash could be used for share repurchases. Assuming an average repurchase price of \$1.50 per share Axcelis could retire 33 million shares.

o The new Axcelis would have approximately 70 million shares outstanding (after repurchases) and be generating \$0.30 in eps. Applying a 10X multiple on this business would equate to a stock price of \$3 per share. Revenue and earnings could grow at the new Axcelis as the market rebounded and SEN proved successful expanding its market share.

o The new Axcelis would have additional assets including net cash of \$50 million and an unencumbered headquarters/ property which was recently appraised at almost \$60 million.

Clearly, the above scenario is very different than the outcome we had all hoped for just a few months ago. However, there is no question that the world has changed and that looking forward and embracing the altered landscape is a prerequisite for future success. We hope that the Board might give full consideration to our proposal and we look forward to continuing to work with you in moving Axcelis forward.

Sincerely,

STERLING CAPITAL MANAGEMENT LLC

Brian R. Walton, CFA  
Managing Director

cc: Mr. Stephen Hardis