



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

October 26, 2010

VIA U.S. Mail and Facsimile

William S. Johnson
Chief Financial Officer
Cabot Microelectronics Corporation
870 North Commons Drive
Aurora, Illinois 60504

Re: Cabot Microelectronics Corporation
Form 10-K for the fiscal year ended September 30, 2009
Filed November 24, 2010
File No. 000-30205

Dear Mr. Johnson:

We have reviewed your response dated October 4, 2010 and related filings and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by providing the requested information or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances, please tell us why in your response.

After reviewing the information you provide in response to these comments, we may have additional comments.

Form 10-K for the fiscal year ended September 30, 2009

Item 11. Executive Compensation, page 78

1. We continue to evaluate your response to prior comment 15. Please expand your response to analyze how disclosure of the 2009 targets on a historical basis would result in competitive harm. For instance, what “extrapolations” about present or future strategy would your competitors gain from disclosure on a historic basis of the five 2009 targets either on a stand-alone basis or in conjunction with disclosure of prior year targets. Explain why you believe that competitors would not independently learn about your strategies from your historical financials or their participation in the market place. Similarly, please tell us how your customers and suppliers would use the 2009 target information to your detriment. We may have further comment after reviewing your response.

You may contact Kristin Lochhead at (202) 551-3664, Gary Todd at (202) 551-3605 or me at (202) 551-3676 if you have questions regarding comments on the financial statements and related matters. If you have other questions, please contact Joe McCann at (202) 551-6262 or Jay Mumford at (202) 551-3637.

Sincerely,

Brian Cascio
Accounting Branch Chief