



DIVISION OF
CORPORATION FINANCE

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

December 17, 2010

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, 2009
File No. 000-30205

Dear Mr. Johnson:

We have reviewed your response dated November 9, 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 amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comment applies to your facts and circumstances or do not believe an amendment is appropriate, 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 note your response to prior comment 1. You have not told us what specific extrapolations about present or future strategies could be gained from disclosure of your 2009 targets on a stand-alone basis or in conjunction with disclosure of prior year targets. In this regard, please provide us with your Fiscal 2009 targets, as well as targets from previous periods, as applicable, and explain the insight into your strategy (*e.g.*, grow market share or maintain market share while increasing profitability) that would be revealed through disclosure. Please also provide us with actual results from 2009 and other periods, as applicable, and explain to us why your strategy is not discernable from these actual results in conjunction with your required Regulation S-K Item 303(a)(3) disclosure concerning your results of operations. Finally, please explain to us why you

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believe that third parties would be able to extrapolate a particular strategy given that it appears that targets could be higher or lower in a given fiscal year based on “macro” and/or “micro” factors unrelated to your strategy. In this regard, we note your statement that the modeling process encompasses data from your industry, your business, your customers and your competitors.

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