

Mail Stop 6010

June 6, 2006

Douglas J. McCutcheon
Chief Financial Officer
Nanometrics Incorporated
1550 Buckeye Drive
Milpitas, California 95035

**Re: Nanometrics Incorporated
Amendment No. 1 to Registration Statement on Form S-4
Filed May 25, 2006
File No. 333-133033**

Dear Mr. McCutcheon:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Joint Proxy Statement

Do any of the directors and executive officers of Accent Optical have any special interests in the merger?, page 7

1. We note your response to prior comment 11. Relocate the disclosure on page 19 to here in order to answer this question.

Proposal Two – Payments to Executives, page 18

2. Quantify the estimated benefits each individual would receive if shareholders approve this proposal.

Opinion of Nanometrics' Financial Advisor, page 62

3. We note your response to prior comment 21. Please quantify the transaction fees to be paid to each of Cowen and Merrill Lynch if the merger is consummated.

Proposal Two

Vote Required, page 162

4. Expand the bold paragraph to explain why it is in the best interests of Accent Optical's stockholders (other than the ones who will directly benefit) to vote for this proposal.

Item 22. Undertakings, page II-2

5. We note your revisions in response to prior comment 34. Please also revise your undertakings to include the undertakings required by Item 512(a)(5) and (6) of Regulation S-K.

Exhibit 8.2

6. Given the first sentence in the second full paragraph on page 2, please file an updated opinion on the date you plan to go effective on the registration statement. Please remove limiting language in the penultimate paragraph that the opinion is "solely for the benefit of the Company" and that it "is not to be used . . . or otherwise relied upon" or make clear that shareholders are entitled to rely on the opinion.

Form 8-K filed March 16, 2006

7. Please refer to our prior comment 37. Please specifically incorporate by reference the Form 8-K/A filed on May 31, 2005 that includes Soluris Inc's 2005 historical and pro forma financial statements into your Form S-4. Also, given the significant impact of the transaction on your 2005 historical and pro forma loss (as disclosed in your Form S-4), we believe it would be appropriate for your Form S-4 pro forma financial statement disclosures to discuss the transaction, to disclose the pro forma impact of the transaction on your fiscal 2005 revenues, loss and loss per share and cross-reference readers to the aforementioned Form 8-K for more information.

Form 10-Q for the quarterly period April 1, 2006

Note 3. Acquisitions, page 7

Soluris, page 7

8. We see that the purchase price allocation was based on an independent appraisal. Please note that since you incorporate your Form 10-Q by reference in your Form S-4 you are required to identify the appraisal firm under "Experts" and include their consent in the registration statement. Alternatively you may state, in revised disclosure, that management is primarily responsible for estimating fair values for impairment purposes

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and considered a number of factors, including valuations or appraisals, when estimating fair value. Regardless of your decision, your disclosure should clearly indicate that management is responsible for the valuation. Please revise your filings as necessary based on our comment.

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As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

You may contact Eric Atallah at (202) 551-3663 or Jay Webb at (202) 551-3603 if you have questions regarding comments on the financial statements and related matters. Please contact Donald C. Hunt at (202) 551-3647 or me at (202) 551-3800 with any other questions.

Sincerely,

Peggy A. Fisher
Assistant Director

cc (via fax): Aaron J. Alter, Esq. – Wilson, Sonsini Goodrich & Rosati LLP