

Mail Stop 6010

October 23, 2006

VIA U.S. MAIL AND FACSIMILE (952.944.6022)

Ms. Roberta L. Dircks
Vice President Finance and Administration and
Chief Financial Officer
Optical Sensors Incorporated
7615 Golden Triangle Drive, Suite C
Minneapolis, Minnesota 55344-3733

**Re: Optical Sensors Incorporated
Form 10-KSB for the fiscal year ended December 31, 2005
Filed March 31, 2006
File No. 000-27600**

Dear Ms. Dircks:

We have reviewed your response letter dated October 19, 2006 and filing and have the following comments. Where indicated, we think you should revise future filings 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 or may not raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filings. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-KSB for the Fiscal Year Ended December 31, 2005

Item 7. Financial Statements, page 24

Note 17. Stockholders' Equity, page 45

1. Please revise future filings to clearly disclose the significant terms of the preferred stock and the rights agreement, consistent with paragraph 4 of SFAS 129 and your response, the current classification of those shares and the change in classification that will occur in December 2006.

Representations

2. Please provide all three of the acknowledgements in the form previously requested.

As appropriate, please revise future filings and respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a letter that keys your responses to our comments and provides any requested information. Detailed letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

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In connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filing or in response to our comments on your filing.

You may contact Kate Tillan, Assistant Chief Accountant, at (202) 551-3604 or me at (202) 551-3671 if you have any questions regarding these comments.

Sincerely,

Martin James
Senior Assistant Chief Accountant