



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

Mail Stop 3030

May 24, 2010

Via Facsimile and U.S. Mail

Mr. Paul F. McLaughlin
Chief Executive Officer
Rudolph Technologies, Inc.
One Rudolph Road, P.O. Box 1000
Flanders, NJ 07836

**Re: Rudolph Technologies, Inc.
Form 10-K for the year ended December 31, 2009
Filed March 5, 2010
File No. 0-27965**

Dear Mr. McLaughlin:

We have reviewed your 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 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 filing. 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-K for the year ended December 31, 2009

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 25

Results of Operations 2007, 2008 and 2009, page 27

1. We note your disclosure that "continued weakness in the overall semiconductor equipment manufacturing sector" impacted your revenues for the period. Please revise future filings as applicable to quantify the effects of volume and pricing changes on your results of operations. Refer to Item 303(A)(3)(iii) of Regulation S-K.

Financial Statements, page 42

Note 15. Segment Reporting and Geographical Information, page F-32

2. We note your disclosure here of your "different sources of revenue." Please explain to us how your presentation here complies with paragraph 280-10-50-40 of the FASB Accounting Standards Codification. In this regard, we note your discussion on page 25 of your "wafer scanner product group" and your "process control group." Further, we note your website that you refer to your products in three categories - metrology solutions, inspection solutions, and analysis solutions. However, we note you have only presented inspection and metrology here.
3. We note your disclosure of revenues by geographic segment. If revenues from customers attributed to any individual country are material, please revise future filings to disclose those revenues separately. Refer to paragraph 280-10-50-41 of the FASB Accounting Standards Codification.
4. Please revise future filings to disclose the basis for attributing revenues from external customers to individual countries in accordance with paragraph 280-10-50-41(a) of the FASB Accounting Standards Codification.

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As appropriate, please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter with your response that keys your responses to our comments and provides any requested 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.

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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 and 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.

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 David Burton, Staff Accountant, at (202) 551-3626 or me at (202) 551-3643 if you have questions regarding comments on the financial statements and related matters. In this regard, do not hesitate to contact Martin James, Senior Assistant Chief Accountant at (202) 551-3671.

Sincerely,

Kevin L. Vaughn
Accounting Branch Chief