NOVA MEASURING INSTRUMENTS LTD
Form 20-F
March 11, 2013

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

Form 20-F

o REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) or (g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2012

OR

o TRANSITION REPORT PURSUANT TO SECTION 13 or 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

o SHELL COMPANY REPORT PURSUANT TO SECTION 13 or 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number 000-30668

NOVA MEASURING INSTRUMENTS LTD.
(Exact name of Registrant as specified in its charter)

Nova Measuring Instruments Ltd.	Israel
(Translation of Registrant's name into English)	(Jurisdiction of incorporation or organization)

Weizmann Science Park, Einstein St., Building 22, 2nd Floor, Ness-Ziona, Israel

(Address of principal executive offices)

Dror David, +972-73-2295833, +972-8-9407776, P.O.B 266, Rehovot 7610201, Israel
(Name, Telephone, E-mail and/or Facsimile number and Address of the Registrant's Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Ordinary Shares, nominal value NIS 0.01 per share	The NASDAQ Global Market

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

None

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report: 26,681,876 ordinary shares, NIS 0.01 nominal (par) value per share, as of December 31, 2012.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes o No x

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Yes o No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes x No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

Yes o No o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer. See definition of "accelerated filer and large accelerated filer" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer o Accelerated filer x Non-accelerated filer o

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP x

International Financing Reporting Standards as issued by the International Accounting Standards Board o

Other o

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow:

Item 17 o Item 18 o

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes o No x

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Introduction

In this Annual Report, the "Company", "Nova", "we" or "our" refers to Nova Measuring Instruments Ltd. and its consolidated subsidiaries, when the context requires.

Our Functional Currency

Unless otherwise indicated, all amounts herein are expressed in United States dollars ("U.S. dollars", "dollars", "USD", "US$" or "$").

The currency of the primary economic environment in which we operate is the U.S. dollar, since substantially all our revenues to date have been denominated in U.S. dollars and over 50% of our expenses are in U.S. dollars or in New Israeli Shekels linked to the dollar. Transactions and balances denominated in dollars are presented at their original amounts. Non-dollar transactions and balances have been re-measured into dollars as required by the principles in ASC 830 Foreign Currency Matters. All exchange gains and losses from such re-measurement are included in the net financial income when they arise.

Cautionary Statement Regarding Forward-Looking Statements

Certain information contained herein, which does not relate to historical financial information, may be deemed to constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The words or phrases "will likely result", "are expected to", "will continue", "is anticipated", "estimate", "project", "believe" or similar expressions identify "forward looking statements". Such statements, including without limitation, statements relating to our anticipated sales, revenues and expenses in 2013, our expectations with respect to our business and operations and our ability to gain market share are subject to certain risks and uncertainties that could cause actual results to differ materially from historical results and those presently anticipated or projected. We wish to caution readers not to place undue reliance on any such forward-looking statements, which speak only as of the date made. We cannot guarantee future results, levels of activity, performance or achievements. We also undertake no obligation to release publicly any revisions to these forward–looking statements to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events. Among the factors that could cause our actual results in the future to differ materially from any opinions or statements expressed with respect to future periods are competitive industry conditions and the ability to forecast the needs of the semiconductor industry with respect to the very cyclical nature of the industry and the very fast pace of technology evolutions and factors related to the conditions of the global markets and the global economy. Various other factors that could cause our actual results to differ materially are set forth in "Item 3D. Risk Factors" in this annual report on Form 20-F and elsewhere herein.

PART I

Item 1. Identity of Directors, Senior Management and Advisors

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

3A. Selected Financial Data

The following selected consolidated financial data as of December 31, 2012 and 2011 and for the years ended December 31, 2012, 2011 and 2010 have been derived from our audited consolidated financial statements included elsewhere in this annual report. These financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"), and audited by our independent registered public accounting firm. The consolidated selected financial data as of December 31, 2010, 2009 and 2008 and for the years ended December 31, 2009 and 2008 have been derived from other consolidated financial statements not included in this Form 20-F that were also prepared in accordance with U.S. GAAP and audited by our independent registered public accounting firm. The selected consolidated financial data set forth below should be read in conjunction with and are qualified by reference to "Item 5. Operating and Financial Review and Prospects" and the consolidated financial statements and notes thereto and other financial information included elsewhere in this annual report on Form 20-F.

Summary of Consolidated Financial Data

	Year ended December 31,				
	2008	2009	2010	2011	2012
	(in thousands, except per share data)				
Consolidated Statement of Operations Data:					
Revenues	$38,969	$39,318	$86,620	$102,828	96,168
Cost of revenues	25,986	21,731	39,204	44,832	45,014
Gross profit	12,983	17,587	47,416	57,996	51,154
Operating expenses:					
Research and development expenses, net	8,606	6,865	12,445	18,677	24,594
Sales and marketing expenses	7,503	6,014	10,133	11,373	11,998
General and administrative expenses	3,199	2,240	2,968	3,229	3,978
Other operating expenses	633	-	-	-	-
Total operating expenses	19,941	15,119	25,546	33,279	40,570
Operating income (loss)	(6,958)	2,468	21,870	24,717	10,584
Financing income (expenses), net	1,537	163	305	901	1,368
Income (loss) before income taxes	(5,421)	2,631	22,175	25,618	11,952
Income taxes expenses (benefit)	-	-	-	(2,500)	124
Net income (loss) for the year	$(5,421)	$2,631	$22,175	$28,118	11,828
Income (loss) per share:					

Basic	$(0.28)	$0.14	$0.91	$1.07	$0.44
Diluted	$(0.28)	$0.13	$0.86	$1.04	$0.43
Shares used in calculation of net income (loss) per share:					
Basic	19,369	19,473	24,448	26,232	26,619
Diluted	19,369	20,089	25,692	26,931	27,277

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	2008	2009	December 31, 2010	2011	2012
			(in thousands)		
Consolidated Balance Sheet Data:					
Working capital	20,246	25,067	65,442	94,669	106,298
Total assets	35,791	40,924	93,377	122,947	142,044
Capital stock (including additional paid-in capital)	84,024	85,696	104,646	108,710	111,062
Shareholders' equity	22,341	26,915	68,384	99,906	114,771

3B. Capitalization and Indebtedness

Not applicable.

3C. Reasons for the Offer and Use of Proceeds

Not applicable.

3D. Risk Factors

Risks Related to Our Business and Our Industry

Because substantially most of our current sales are dependent on two specific product lines, factors that adversely affect the pricing and demand for these product lines could substantially reduce our sales.

We are currently dependent on two process control product lines. We expect revenues from these product lines to continue to account for a substantial portion of our revenues for at least the next 12 months. As a result, factors adversely affecting the pricing of, or demand for, these product lines, such as competition and technological change, could significantly reduce our sales.

The markets we target are highly cyclical and it is difficult to predict the length and strength of any downturn or expansion period.

The semiconductor capital equipment market and industries, which are highly cyclical, experienced a steep upturn in 2010 and 2011, after a significant decline in sales in 2008 and 2009. According to Gartner, Inc., a market research company, the forecast for year 2013 (as of December 2012), predicts a 10% decrease in wafer fab equipment (WFE) spending. Although we rely on market research companies, we cannot predict the length and strength of the downturns or expansions.

Our inability to significantly reduce spending during a protracted slowdown in the semiconductor industry could reduce our prospects of achieving continued profitability.

Historically, we have derived all of our revenues, and we expect to continue to derive practically all of our revenues, from sales of our products and related services to the semiconductor industry. Our business depends in large part upon capital expenditures by semiconductor manufacturers, which in turn depend upon the current and anticipated demand for semiconductors. The semiconductor industry has experienced severe and protracted cyclical downturns and upturns. Specifically, during 2010, the semiconductor industry experienced a steep upturn of over 100%, which followed a severe downturn in 2008 and 2009. During cyclical downturns, as those we have experienced in the past and are likely to experience in the future, material reductions in the demand for the type of capital equipment and

process technology that we offer may result in a decline in our sales. In addition, our ability to significantly reduce expenses in response to any downturn or slowdown in the rate of capital investment by manufacturers in these industries may be limited because of:

- Ÿ our continuing need to invest in research and development;

- our continuing need to market our new products to new and existing customers; and
- our extensive ongoing customer service and support requirements worldwide.

As a result, we may have difficulty achieving continued profitability during a protracted slowdown.

If we do not respond effectively and on a timely basis to rapid technological change, our ability to attract and retain customers could be diminished, which would have an adverse effect on our sales and ability to remain competitive.

The semiconductor manufacturing industry is characterized by rapid technological change, new product introductions and enhancements and evolving industry standards. Our ability to remain competitive and generate sales revenue will depend in part upon our ability to develop new and enhanced systems at competitive prices in a timely and cost-effective manner and to accurately predict technology transitions. Because new product development commitments must be made well in advance of sales, new product decisions must anticipate the future demand for products. If we fail to correctly anticipate future demand for products, our sales and competitive position will suffer. In addition, the development of new measurement technologies, new product introductions or enhancements by our competitors could cause a decline in our sales or loss of market acceptance of our existing products.

We depend on PEM for sales of our integrated metrology systems, and the loss of our PEM as business partners could harm our business.

We believe that sales of integrated metrology systems will continue to be an important source of our revenues. Sales of our integrated metrology systems depend upon the ability of PEMs (process equipment manufacturers) to sell semiconductor equipment products that are able to include our metrology systems as components. If our PEMs are unable to sell such products, or if they choose to focus their attention on products that do not integrate our systems, our business could suffer. If we were to lose our PEMs as business partners for any reason, our inability to realize sales from integrated metrology systems could harm our business. We may not be able to develop or market new products, which could slow or prevent our growth.

Some of our commercial agreements with process equipment manufacturers and customers may include exclusivity provisions. Such exclusivity obligations may prevent us from engaging in certain business relationships with third parties, and thus may affect our ability to introduce new products into relevant markets.

Some of our commercial agreements with process equipment manufacturers and customers may include exclusivity provisions, which prevent us from engaging in certain business relationships with third parties. These exclusivity obligations are usually limited in terms of scope and length, and they usually affect our ability to engage in certain business activities relating to a specific technology, component or product. When considering whether to enter into any such exclusivity arrangements, we usually take into the consideration the terms of the exclusivity (e.g. length and scope), the expected benefit to the Company, and the risks and limitations associated with such exclusivity undertakings. Exclusivity obligations relating to our technology and products may affect our ability to commercialize our products, engage in potentially beneficial business relationships with third parties, or introduce new products into relevant markets, which could slow or prevent our growth.

If any of our systems fail to meet or exceed our internal quality specifications, we cannot ship them until such time as they have met such specifications. If we experience significant delays or are unable to ship our products to our customers as a result of our internal processes or for any other reason, our business and reputation may be adversely affected.

Our products are complex and require technical expertise to design and manufacture. Various problems occasionally arise during the manufacturing process that may cause delays and/or impair product quality. We actively monitor our manufacturing processes to ensure that our products meet our internal quality specifications. Any significant delays stemming from the failure of our products to meet or exceed our internal quality specifications, or for any other reasons, would delay our shipments. Shipment delays could be harmful to our business, revenues and reputation in the industry.

We are exposed to cyber security risks that, if materialized, may affect our business and operations.

Our global operations are linked by information systems, including telecommunications, the internet, our corporate intranet, network communications, email and various computer hardware and software applications. Despite our implementation of network security measures, our tools and servers are vulnerable to computer viruses, break-ins and similar disruptions from unauthorized tampering with our computer systems and tools located at customer sites, or could be subject to system failures or malfunctions for other reasons. System failures or malfunctioning could disrupt our operations and our ability to timely and accurately process and report key components of our financial results.

We may incorporate open source technology in some of our software and products, which may expose us to liability and have a material impact on our product development and sales

Some of our software and products may utilize open source technologies. These technologies may be subject to certain open source licenses, including but not limited to the General Public License, which, when used or integrated in particular manners, impose certain requirements on the subsequent use of such technologies, and pose a potential risk to proprietary nature of products. In the event that we have or will in the future, use or integrate software that is subject to such open source licenses into or in connection with our products in such ways that will trigger certain requirements of these open source licenses, we may (i) be required to include certain notices and abide by other requirements in the absence of which we may be found in breach of the copyrights owned by the creators of such open source technologies; and/or (ii) be required to disclose our own source code or parts thereof to the public, which could enable our competitors to eliminate some or any technological advantage that our products may have over theirs. Any such requirement to disclose our source code or other confidential information related to our products, and the failure to abide by license requirement resulting in copyright infringement, could materially adversely affect our competitive position and impact our business results of operations and financial condition.

New product lines that we may introduce in the future may contain defects, which will require us to allocate time and financial resources to correct.

Our new product lines may contain defects when first introduced. If there are defects, we will need to divert the attention of our personnel from our ongoing product development efforts to address the detection and correction of the defects. In the past, no liability claims have been filed against us for damages related to product defects, and we have not experienced any material delays as a result of product defects. However, we cannot provide assurances that we will not incur these costs or liabilities or experience these lags or delays in the future. Moreover, the occurrence of such defects, whether caused by our products or the products of another vendor, may result in significant customer relations problems and adversely affect our reputation and may impair the market acceptance of our products.

We have historically generated losses and may incur future losses.

Starting year 2009, we have been able to demonstrate continued profitability, yet since our inception in 1993, we have had several years of losses and we may incur net losses in future years. As of December 31, 2012, we had an accumulated profit of approximately $3.3 million. We plan to increase our aggregate operating expenses in 2013 relative to 2012. However, our ability to generate profits is dependent mainly on our ability to generate sufficient sales. In the future, our sales may not be sufficient to cover the increase in our expenses and we may not be able to maintain profitability, mainly during a protracted slowdown.

Our dependence on a single manufacturing facility magnifies the risk of an interruption in our production capabilities.

We have only one manufacturing facility, which is located in Weizman Science Park, Ness-Ziona-Rehovot, Israel (the "Manufacturing Facility"). Although we adopted a disaster recovery plan, any event affecting this site, including

natural disaster, labor stoppages or armed conflict, may disrupt or indefinitely discontinue our manufacturing capabilities and could significantly impair our ability to fulfill orders and generate revenues, thus negatively impacting our business.

Our lease agreements for our Manufacturing Facility include provisions that exempt the landlord and others from liability for damages to our Manufacturing Facility.

Pursuant to our lease agreements for our Manufacturing Facility (which is also our headquarters), the landlord and anyone on its behalf, and additional companies in Weizman Science Park are exempt from any liability for direct or consequential damages to our Manufacturing Facility, except in the event of willful misconduct. While we have an insurance policy against certain damages, the aforementioned exemption of liability could compromise our ability to recover the full amount of such damages, and consequently we may incur substantial costs upon the occurrence of such damages.

Because shipment dates may be changed and some of our customers may cancel or delay orders with little or no penalty, and since we encounter difficulties in collecting cancellation fees from our customers, our backlog may not be a reliable indicator of actual sales and financial results.

We schedule production of our systems based upon order backlog and customer forecasts. We include in backlog only those orders to which the customer has assigned a purchase order number and for which delivery has been specified. In general, our ability to rely on our backlog for future forecasting and planning is limited because shipment dates may be changed, some customers may cancel or delay orders with little or no penalty, and our ability to collect cancelation fees from customers is not assured. Thus, our backlog may not be a reliable indicator of actual sales and financial results.

We experience quarterly fluctuations in our operating results, which may adversely impact our share price.

Our quarterly operating results have fluctuated significantly in the past. This trend may continue. A principal reason is that we derive a substantial portion of our revenue from the sale of a relatively small number of systems to a relatively small number of customers. As a result, our revenues and results of operations for any given quarter may decrease due to factors relating to the timing of orders, the timing of shipments of systems, and the timing of recognizing these revenues. Furthermore, our quarterly results are affected by the highly cyclical nature of the semiconductor capital equipment market and industries.

We also have a limited ability to predict revenues for future quarterly periods and, as a result, face risks of revenue shortfalls. If the number of systems we actually ship, and thus the amount of revenues we are able to record in any particular quarter, is below our expectations, the adverse effect may be magnified by our inability to adjust spending quickly enough to compensate for the revenue shortfall.

We depend on a small number of large customers, and the loss of one or more of them could significantly lower our revenues.

Like our peers serving the semiconductor market, our customer base is highly concentrated among a limited number of large customers. We anticipate that our revenues will continue to depend on a limited number of major customers, although the companies considered to be our major customers and the percentage of our revenue represented by each major customer may vary from period to period. The loss of any one of our major customers would adversely affect our revenues. Furthermore, if any of our customers become insolvent or have difficulties meeting their financial obligations to us for any reason, we may suffer losses.

We operate in an extremely competitive market, and if we fail to compete effectively, our revenues and market share will decline.

Although the market for process control systems used in semiconductor manufacturing is currently concentrated and characterized by relatively few participants, the semiconductor capital equipment industry is intensely competitive. We compete mainly with Nanometrics, Inc., Rudolph Technologies, Inc., and KLA-Tencor Corp. which manufacture and sell integrated and/or stand-alone process control systems. In addition, we compete with process equipment manufacturers, such as Tokyo Electron Ltd., which manufactures integrated metrology products and with process equipment manufacturers, such as Applied Materials, Inc., which develop in-situ sensors and products. Established companies, both domestic and foreign, compete with our product lines, and new competitors enter our market from time to time. Some of our competitors have greater financial, engineering, manufacturing and marketing resources than we do. If a particular customer selects a competitor’s capital equipment, we expect to experience difficulty in selling to that customer for a significant period of time. A substantial investment is required by the customers to evaluate, test, select and integrate capital equipment into a production line. As a result, once a manufacturer has

selected a particular vendor's capital equipment, we believe that the manufacturer generally relies upon that equipment for the specific production line application and frequently will attempt to consolidate its other capital equipment requirements with the same vendor. Accordingly, unless our systems offer performance or cost advantages that outweigh a customer's expense of switching to our systems, it will be difficult for us to achieve significant sales from that customer once it has selected another vendor's system for an application. We believe that our ability to compete successfully depends on a number of factors both within and outside of our control, including:

Ÿ the contribution of our equipment to the customers' productivity;

- our product quality and performance;
- our global technical service and support;
- the return on investment (ROI) of our equipment and its cost of ownership;
- the breadth of our product line;
- our success in developing and marketing new products; and
- the extendibility of our products.

If we fail to compete in a timely and cost-effective manner against current or future competitors, our revenues and market share will decline.

The ongoing consolidation in our industry may harm us if our competitors are able to offer a broader range of products and greater customer support than we can offer.

We believe that the semiconductor capital equipment market is undergoing consolidation. A number of capital equipment suppliers have been acquired by larger equipment manufacturers. For example, in 2005 Rudolph Technologies, Inc. acquired August Technologies, Inc., in 2006 Nanometrics acquired Soluris, Inc. and Accent Technologies, Inc., in 2007 KLA-Tencor Corp. acquired Therma-Wave, Inc. and Nanometrics acquired Tevet Ltd., and in 2011 Nanometrics acquired Nanda Technologies. We believe that similar acquisitions and business combinations involving our competitors, our customers and the process control manufacturers may occur in the future. These acquisitions could adversely impact our competitive position by enabling our competitors and potential competitors to expand their product offerings and customer service, which could provide them an advantage in meeting customers' needs, particularly with those customers that seek to consolidate their capital equipment requirements with a smaller number of vendors. The greater resources, including financial, marketing, intellectual property and support resources, of competitors involved in these acquisitions could allow them to accelerate the development and commercialization of new competitive products and the marketing of existing competitive products to their larger installed bases. Accordingly, such business combinations and acquisitions by competitors or customers could jeopardize our competitive position.

We may not be successful in our efforts to complete and integrate future acquisitions, which could disrupt our current business activities and adversely affect our results of operations or future growth.

Any future acquisitions may involve many risks, including the risks of:

- diverting management's attention and other resources from our ongoing business concerns;
- entering markets in which we have no direct prior experience;
- improperly evaluating new services, products and markets;
- being unable to maintain uniform standards, controls, procedures and policies;
- being unable to integrate new technologies or personnel;
- incurring the expenses of any undisclosed or potential liabilities; and

- Ÿ the departure of key management and employees.

If we are unable to successfully complete future acquisitions or to effectively integrate any future acquisitions, our ability to grow our business or to operate our business effectively could be reduced, and our business, financial condition and operating results could suffer. Even if we are successful in completing acquisitions, we cannot assure you that we will be able to integrate the operations of the acquired business without encountering difficulty regarding different business strategies with respect to marketing and integration of personnel with disparate business backgrounds and corporate cultures.

Some of our contracts and arrangements potentially subject us to the risk of significant or non-limited liability.

We produce highly complex optical and electronic components and, accordingly, there is a risk that defects may occur in any of our products. Such defects can give rise to significant costs, including expenses relating to recalling products, replacing defective items, writing down defective inventory and loss of potential sales. In addition, the occurrence of such defects may give rise to product liability and warranty claims, including liability for damages caused by such defects.

In our commercial relationship with customers, we attempt to negotiate waivers of consequential damages arising from damages for loss of use, loss of product, loss of revenue and loss of profit caused by our products. Similarly, with respect to our commercial relationship with subcontractors and suppliers, we attempt to negotiate arrangements which do not include a limitation of liabilities and limitation of consequential damages. However, some contracts and arrangements we are bound by expose us to product liability claims resulting in personal injury or death, up to an unlimited amount, and the incurrence of the risk of material penalties for consequential or liquidated damages. Additionally, under such contracts and arrangements, we may be named in product liability claims even if there is no evidence that our products caused the damage in question, and such claims could result in significant costs and expenses relating to attorneys' fees and damages.

Although we have not incurred material penalties for consequential or liquidated damages during the past, we may incur such penalties in the future. Such penalties for consequential or liquidated damages may be significant and could negatively affect our financial condition or results of operations.

Because of our small size, we depend on a small number of employees who possess both executive and technical expertise, and the loss of any of these key employees would hurt our ability to implement our strategy and to compete effectively.

Because of our small size and our reliance on employees with both executive and advanced technical skills, our success depends significantly upon the continued contributions of our officers and key personnel. All of our key management and technical personnel have expertise, which is in high demand among our competitors, and the loss of any of these individuals could cause our business to suffer. We do not maintain life insurance policies for our officers and directors.

Our lengthy sales cycle increases our exposure to customer delays in orders, which may result in obsolete inventory and volatile quarterly revenues.

Sales of our systems depend, in significant part, upon our customers adding new manufacturing capacity or expanding existing manufacturing capacity, both of which involve a significant capital commitment. We may experience delays in finalizing sales following initial system qualification while a customer evaluates and approves an initial purchase of our systems. In general, for new customers or applications, our normal sales cycle takes between six to 12 months to complete. During this time, we may expend substantial funds and management effort, but fail to make any sales. Lengthy sales cycles subject us to a number of significant risks, including inventory obsolescence and fluctuations in operating results, over which we have limited control.

Because of the technical nature of our business, our intellectual property is extremely important to our business, and our inability to protect our intellectual property would harm our competitive position.

As of February 15, 2013, we have been granted about 100 U.S. patents and have 21 U.S. patent applications pending including US provisional patent applications. In addition, we have been granted approximately 40 non-U.S. patents and have about 30 non-U.S. patent applications pending.

We cannot assure that:

- pending patent applications will be approved;
- any patents will be broad enough to protect our technology, will provide us with competitive advantages or will not be challenged or invalidated by third parties; or

Ÿ the patents of others will not have an adverse effect on our ability to do business.

We also cannot assure that others will not independently develop similar products, duplicate our products or, if patents are issued to us, design around these patents. Furthermore, because patents may afford less protection under foreign law than is available under U.S. law, we cannot assure that any foreign patents issued to us will adequately protect our proprietary rights.

In addition to patent protection, we also rely upon trade secret protection, employee and third-party nondisclosure agreements and other intellectual property protection methods to protect our confidential and proprietary information. Despite these efforts, we cannot be certain that others will not otherwise gain access to our trade secrets or disclose our technology.

Furthermore, we may be required to institute legal proceedings to protect our intellectual property. If such legal proceedings are resolved adversely to us, our competitive position and/or results of operations could be harmed. For additional information on our intellectual property, see "Item 4B – Intellectual Property" in this annual report on Form 20-F.

There has been significant litigation involving intellectual property rights in the semiconductor and related industries, and similar litigation involving Nova could force us to divert resources to defend against such litigation or deter our customers from purchasing our systems.

We have been, and may in the future be, notified of allegations that we may be infringing intellectual property rights possessed by others. In addition, we may be required to commence legal proceedings against third parties, which may be infringing our intellectual property, in order to defend our intellectual property. In the future, protracted litigation and expense may be incurred to defend ourselves against alleged infringement of third party rights or to defend our intellectual property against infringement by third parties. Adverse determinations in that type of litigation could:

- result in our loss of proprietary rights;
- subject us to significant liabilities, including treble damages in some instances;
- require us to seek licenses from third parties, which licenses may not be available on reasonable terms or at all; or
- prevent us from selling our products.

Any litigation of this type, even if we are ultimately successful, could result in substantial cost and diversion of time and effort by our management, which by itself could have a negative impact on our profit margin, available funds, competitive position and ability to develop and market new and existing products. For additional information on our intellectual property, see "Item 4B – Intellectual Property" in this annual report on Form 20-F.

We depend on a limited number of suppliers, and in some cases a sole supplier. Any disruption or termination of these supply channels may adversely affect our ability to manufacture our products and to deliver them to our customers.

We purchase components, subassemblies and services from a limited number of suppliers and occasionally from a single source. Disruption or termination of these sources could occur (due to several factors, including, but not limited to, work stoppages, acts of war, terrorism, fire, earthquake, energy shortages, flooding or other natural disasters), and these disruptions could have at least a temporary adverse effect on our operations. Although we generally maintain an inventory of critical components used in the manufacture and assembly of our systems, such supplies may not be sufficient to avoid potential delays that could have an adverse effect on our business.

To date, we have not experienced any material disruption or termination of our supply sources. However, on March 11, 2011, an earthquake followed by a tsunami devastated the north-east coast of Japan, causing thousands of deaths and extensive damage, as well as a potential nuclear disaster. Although our direct suppliers in Japan reported that damage to their physical assets was not significant on a consolidated basis and therefore we have no evidence that continuous supply will be interrupted, the damages caused to Japan's energy supplies, local infrastructure and distribution channels could potentially adversely affect us in the future. In addition, the 2011 floods in Thailand disrupted hard drive production by companies with factories in Thailand, including Seagate, Toshiba and Western Digital. As a results, Intel Corporation has cut its revenue forecast for the fourth quarter of 2011 by about 7%, saying that floods in Thailand that have constrained hard drive production will affect PC sales. Although we were not directly impacted by these specific cases, other cases in the future may impact our business.

A prolonged inability on our part to obtain components included in our systems on a cost-effective basis could adversely impact our ability to deliver products on a timely basis, which could harm our sales and customer relationships.

We are dependent on international sales, which expose us to foreign political and economic risks that could impede our plans for expansion and growth.

Our principal customers are located in Taiwan, South Korea, China, the United States, Germany and Singapore, and we produce our products in Israel. International operations expose us to a variety of risks that could seriously impact our financial condition and impede our growth. For instance, trade restrictions, changes in tariffs and import and export license requirements could adversely affect our ability to sell our products in the countries adopting or changing those restrictions, tariffs or requirements. This could reduce our sales by a material amount.

We may be affected by instability in the global economy, including the recent European economic and financial turmoil.

Instability in the global credit markets, including the recent European economic and financial turmoil related to sovereign debt issues in certain countries, the instability in the geopolitical environment in many parts of the world and other disruptions, such as changes in energy costs, may continue to put pressure on global economic conditions. The world has recently experienced a global macroeconomic downturn, and if global economic and market conditions, or economic conditions in key markets, remain uncertain or deteriorate further, we may experience material impacts on our business, operating results, and financial condition.

Because we derive a significant portion of our revenues from sales in Asia, our sales could be hurt by the instability of Asian economies.

A number of Asian countries have experienced political and economic instability. For instance, Taiwan and China have had a number of disputes, as have North and South Korea, and Japan has for a number of years experienced significant economic instability. Additionally, the Asia-Pacific region is susceptible to the occurrence of natural disasters, such as earthquakes, cyclones, tsunamis and flooding. We have subsidiaries in Taiwan, Japan and South Korea and we have significant customers in Taiwan and South Korea as well as in China. An outbreak of hostilities or other political upheaval, economic downturns or the occurrence of a natural disaster in these or other Asian countries would likely harm the operations of our customers in these countries, causing our sales to suffer.

A large number of our ordinary shares continue to be owned by a relatively small number of shareholders, whose future sales of our shares, if substantial, may depress our share price.

If our principal shareholders sell substantial amounts of our ordinary shares, including shares issued upon the exercise of outstanding options or warrants, the market price of our ordinary shares may fall. As of February 15, 2013, we had 26,717,578 ordinary shares outstanding. Based on reports filed with the Securities and Exchange Commission, which we also refer to herein as the Commission or SEC, information provided to us by our transfer agent and information provided by certain shareholders, our largest shareholder held approximately 8.14% of our outstanding ordinary shares as of February 15, 2013.

Certain shareholders may control the outcome of matters submitted to a vote of our shareholders, including the election of directors.

To the best of our knowledge, approximately 32.95% of our outstanding ordinary shares are cumulatively held by five of our shareholders. As a result, and although we are currently not aware of any voting agreement between such shareholders, if these shareholders voted together or in the same manner, they would have the ability to control the outcome of corporate actions requiring an ordinary majority vote of shareholders as set in the Company's Amended and Restated Articles of Association. Even if these five shareholders do not vote together, each one of them may have the ability to influence the outcome of corporate actions requiring the vote of shareholders as set in the Company's Amended and Restated Articles of Association. For additional information on our major shareholders, see "Item 7A – Major Shareholders" in this annual report on Form 20-F.

The market price of our ordinary shares may be affected by a limited trading volume and may fluctuate significantly.

In the past there has been a limited public market for our ordinary shares and there can be no assurance that an active trading market for our ordinary shares will continue. An absence of an active trading market could adversely affect our shareholders' ability to sell our ordinary shares in short time periods. Our ordinary shares have experienced, and are likely to experience in the future, significant price and volume fluctuations, which could adversely affect the

market price of our ordinary shares without regard to our operating performance.

We manage our available cash through various bank institutions and invest large portions of our cash reserves in bank deposits. A bankruptcy of one of the banks in which or through which we hold or invest our cash reserves, might prevent us to access that cash for an uncertain period of time.

We manage our available cash through various bank institutions and invest large portions of our cash reserves in bank deposits. As of December 31, 2012, approximately 98% of our cash reserves were invested in Israeli based bank institutions, of which 40% was invested in one institution. A bankruptcy of one of the banks in which we hold our cash reserves or through which we invest our cash reserves, might prevent us to access that cash for an uncertain period of time.

We may fail to maintain effective internal control over financial reporting in accordance with Section 404 of the Sarbanes-Oxley Act of 2002.

The Sarbanes-Oxley Act of 2002 imposes certain duties on us and our executives and directors. Our efforts to comply with the requirements of Section 404 (Assessment of Internal Control), which started in connection with our Annual Report on Form 20-F for the fiscal year ended December 31, 2007, have resulted in increased general and administrative expense and a diversion of management time and attention, and we expect these efforts to require the continued commitment of resources. Section 404 of the Sarbanes-Oxley Act of 2002 requires (i) management's annual review and evaluation of our internal control over financial reporting and (ii) an attestation report issued by an independent registered public accounting firm on our internal control over financial reporting, in connection with the filing of our Annual Report on Form 20-F for each fiscal year. We have documented and tested our internal control systems and procedures in order for us to comply with the requirements of Section 404. While our assessment of our internal control over financial reporting resulted in our conclusion that as of December 31, 2012, our internal control over financial reporting was effective, we cannot predict the outcome of our testing in future periods. If we fail to maintain the adequacy of our internal controls, we may not be able to ensure that we can conclude on an ongoing basis that we have effective internal controls over financial reporting. Failure to maintain effective internal control over financial reporting could result in investigation or sanctions by regulatory authorities, and could have a material adverse effect on our operating results, investor confidence in our reported financial information, and the market price of our ordinary shares.

Risks Related to Operations in Israel

Potential political, economic and military instability in Israel may adversely affect our growth and revenues.

Our principal offices and manufacturing facilities and many of our suppliers are located in Israel. Although most of our sales are currently being made outside Israel, potential political, economic and military conditions in Israel directly affect our operations.

Since the establishment of the State of Israel in 1948, a number of armed conflicts have occurred between Israel and its Arab neighbors. In July 2006, there have been extensive hostilities along Israel's northern border with Lebanon. Since June 2007, the Hamas militant group has taken over the Gaza Strip from the Palestinian Authority, and the hostilities along Israel's border with the Gaza Strip have increased, escalating to a wide scale attack by Israel and continuous rocket attacks into southern and center of Israel in December 2008 and in November 2012. Some of the November 2012 rocket attacks have resulted in damages in areas which are close to our Manufacturing Facility. Moreover, since December 2010, there has been a wave of protests and civil resistance demonstrations in several countries in the Middle East and North Africa, including Egypt and Syria, both of which share a border with Israel. The demonstrations and acts of civil resistance in Egypt led to the resignation of the former Egyptian president Hosni Mubarak and to extensive revisions in the Egyptian governmental structure. It is not clear how this revolutionary wave, also known as the Arab Spring, will develop and how it will affect the political and security situation in the Middle East. It is also not clear how it will affect Israel and its relationship with its Arab neighbors. In addition, it is widely believed that Iran, which has previously threatened to attack Israel, has been stepping up its efforts to achieve nuclear capability. Iran is also believed to have a strong influence among extremist groups in the region, such as Hamas in Gaza and Hezbollah in Lebanon. The Syrian Civil War, and the violent acts of President Bashar al-Assad against the protest movement known as the Arab Spring, brought tension to the Israel's border with Syria. The tension between Israel and Iran may escalate in the future and turn violent, which could affect the Israeli economy generally and us in particular. Moreover, the resumption of hostilities in the region, and the on-going tension in the region, have a negative effect on the stability of the region which might have a negative effect on our business and harm our growth and revenues.

Our operations may be disrupted by the obligation of key personnel to perform military service.

Some of our executive officers and employees in Israel are obligated to perform significant periods of military reserve service until the age of 40 for soldiers and until the age of 45 for officers. This time-period may also be extended by the Military Chief of the General Staff and the approval of the Minister of Defense or by a directive of the Minister of Defense in the event of a declared national emergency. Our operations could be disrupted by the absence for a significant period of one or more of our executive officers or key employees due to military service. To date, our operations have not been materially disrupted as a result of these military service obligations. Any disruption in our operations due to such obligations would adversely affect our ability to produce and market our existing products and to develop and market future products.

Provisions of our Amended and Restated Articles of Association and Israeli law may delay, prevent or make difficult an acquisition of Nova, which could prevent a change of control and negatively affect the price of our ordinary shares.

Israeli corporate law regulates mergers, requires tender offers for acquisitions of shares above specified thresholds, for special approvals for transactions involving directors, officers or significant shareholders and regulates other matters that may be relevant to these types of transactions. Furthermore, Israeli tax considerations may make potential transactions unappealing to us or to some of our shareholders. See Item 10.B, "Additional Information – Memorandum and Articles of Association". For a more detailed discussion regarding some anti-takeover effects of Israeli law.

These provisions of Israeli law may delay, prevent or make difficult an acquisition of Nova, which could prevent a change of control and therefore depress the price of our shares.

The rights and responsibilities of our shareholders are governed by Israeli law and differ in some respects from the rights and responsibilities of shareholders under U.S. law.

We are incorporated under Israeli law. The rights and responsibilities of holders of our ordinary shares are governed by our Amended and Restated Articles of Association and by the Israeli Companies Law, 1999 (the "Companies Law"). These rights and responsibilities differ in some respects from the rights and responsibilities of shareholders in typical U.S. corporations. In particular, pursuant to the Companies Law each shareholder of an Israeli company has to act in good faith in exercising his or her rights and fulfilling his or her obligations toward the company and other shareholders and to refrain from abusing his power in the company, including, among other things, in voting at the general meeting of shareholders and class meetings, on amendments to a company's articles of association, increases in a company's authorized share capital, mergers, and transactions requiring shareholders' approval under the Companies Law. In addition, a controlling shareholder of an Israeli company or a shareholder who knows that it possesses the power to determine the outcome of a shareholder vote or who has the power to appoint or prevent the appointment of a director or officer in the company, or has other powers toward the company has a duty of fairness toward the company. However, Israeli law does not define the substance of this duty of fairness. Because Israeli corporate law has undergone extensive revision in recent years, there is little case law available to assist in understanding the implications of these provisions that govern shareholder behavior.

Because most of our revenues are generated in U.S. dollars, but a significant portion of our expenses is incurred in currencies other than U.S. dollars, and mainly New Israeli Shekels, our profit margin may be seriously harmed by currency fluctuations.

We generate most of our revenues in U.S. dollars, but incur a significant portion of our expenses in currencies other than U.S. dollar, and mainly New Israeli Shekel, commonly referred to as NIS. As a result, we are exposed to risk of devaluation of the U.S. dollar in relation to the NIS and other currencies. In that event, the dollar cost of our operations in countries other than the U.S. will increase and our dollar measured results of operations will be adversely affected. During 2012, the U.S. dollar revaluated against the NIS by 2.3%, after devaluated by approximately 5.8% in the previous three years. We cannot predict the future trends in the rate of devaluation or revaluation of the U.S. dollar against the NIS, and our operations also could be adversely affected if we are unable to hedge against currency fluctuations in the future.

We participate in government programs under which we receive tax and other benefits. These programs impose restrictions on our ability to use the technologies developed under these programs. In addition, the reduction or termination of these programs would increase our costs.

We receive royalty-bearing grants from the Office of the Chief Scientist of the Israeli Ministry of Industry, Trade and Labor, or OCS, for the financing of certain of our research and development programs that meet specified criteria. We

are also eligible to receive tax benefits under Israeli law for capital investments that are designated as “approved enterprises”. To maintain our eligibility for these programs and tax benefits, we must continue to meet certain conditions, including paying royalties related to grants received and making specified investments in fixed assets. Some of these programs also restrict our ability to manufacture particular products and transfer particular technology, which were developed as part of the OCS's programs outside of Israel. The restrictions associated with receiving such OCS's grants may require us to obtain approval of the research and development committee nominated by the OCS for certain actions and transactions and pay additional royalties to the OCS. Such approval may be given only if the recipient abides by all the provisions of the law and related regulations. Approval to manufacture products outside of Israel or consent to the transfer of technology, if requested, might not be granted.

If we fail to comply with these conditions in the future, the benefits received could be cancelled. We could also be required to pay increased taxes or refund any benefits previously received, adjusted for inflation and interest. In addition, if we fail to comply with certain restrictions associated with receiving such OCS's grants, we may be subject to criminal charges. In each of the years 2011 and 2010, we recorded an aggregate of $2.2 million, in grants under Israeli government programs, and in 2012 we received grants which totaled $1.7 million. As of December 31, 2012, our contingent liability to the Office of the Chief Scientist for grants received was approximately $19.8 million. (See also Note 7A to our consolidated financial statements contained elsewhere in this report). From time to time, we submit requests for new grants from the Office of the Chief Scientist and for expansion of our approved enterprise programs. These requests might not be approved. Also, the Israeli government may reduce or eliminate these benefits in the future. The termination or reduction of these grants or tax benefits could harm our business, financial condition and results of operations. In addition, if we increase our activities outside Israel due to, for example, future acquisitions or outsourcing of manufacturing or development activities, these activities generally will not be eligible for inclusion in Israeli grants or tax benefit programs. Accordingly, our effective corporate tax rate could increase significantly in the future and our grants may continue to reduce.

Any shareholder with a cause of action against us as a result of buying, selling or holding our ordinary shares may have difficulty asserting a claim under U.S. securities laws or enforcing a U.S. judgment against us or our officers, directors or Israeli auditors.

We are organized under the laws of the State of Israel, and we maintain most of our operations in Israel. Most of our officers and directors as well as our Israeli auditors reside outside of the United States and a substantial portion of our assets and the assets of these persons are located outside the United States. Therefore, if you wish to enforce a judgment obtained in the United States against us, or our officers, directors and auditors, you will probably have to file a claim in an Israeli court. Additionally, you might not be able to bring civil actions under U.S. securities laws if you file a lawsuit in Israel. We have been advised by our Israeli counsel that Israeli courts generally enforce a final executory judgment of a U.S. court for liquidated amounts in civil matters after a hearing in Israel. If a foreign judgment is enforced by an Israeli court, it will be payable in Israeli currency. However, payment in the local currency of the country where the foreign judgment was given shall be acceptable, subject to applicable foreign currency restrictions.

Our shares are listed for trade on more than one stock exchange, and this may result in price variations.

Our ordinary shares are listed for trading on The NASDAQ Global Select Market and on the Tel Aviv Stock Exchange Ltd., or TASE. This may result in price variations. Our ordinary shares are traded on these markets in different currencies, U.S. dollars on The NASDAQ Global Select Market and New Israeli Shekels on the TASE. These markets have different opening times and close on different days. Different trading times and differences in exchange rates, among other factors, may result in our shares being traded at a price differential on these two markets. In addition, market influences in one market may influence the price at which our shares are traded on the other.

We may be classified as a “passive foreign investment company” for U.S. income tax purposes, which could have significant and adverse tax consequences to U.S. shareholders.

Generally, if for any taxable year 75% or more of our gross income consists of specified types of passive income, or, on average, at least 50% of our assets are held for the production of, or produce, passive income, we may be characterized as a passive foreign investment company (a “PFIC”) for U.S. federal income tax purposes. Classification of Nova as a PFIC could result in adverse U.S. tax consequences to our U.S. shareholders, including having gain realized on the sale or other disposition of our shares being treated as ordinary income as opposed to capital gain income, and computing tax liability on that gain, as well as on dividends and other distributions, as if the income had been earned ratably over each day in the U.S. holder’s holding period for the shares. In addition, an interest charge will

be imposed on the amount of the tax allocated to these taxable years. It may be possible for U.S. holders of common shares to mitigate certain of these consequences by making an election to treat us as a "qualified electing fund" under Section 1295 of the Internal Revenue Code of 1986, as amended (the "Code") or a "mark-to-market election" under Section 1296 of the Code. U.S. shareholders should consult with their own U.S. tax advisors with respect to the U.S. tax consequences of investing in our ordinary shares.

We believe that in 2012 we were not a PFIC. Nonetheless, because the determination of whether we are, or will be, a PFIC for a taxable year depends, in part, on the application of complex U.S. federal income tax rules, which are subject to various interpretations, there is a risk that we were a PFIC in 2012. Absent one of the elections described above, if we are a PFIC for any taxable year during which a U.S. holder holds our ordinary shares, we generally will continue to be treated as a PFIC regardless of whether we cease to meet the PFIC tests in one or more subsequent years. Currently we expect that we will not be a PFIC in 2013. However, PFIC status is determined based on our assets and income over the course of each taxable year, and is dependent on a number of factors, including the value of a corporation's assets, the trading price of our ordinary shares and the amount and type of its gross income. Therefore, there can be no assurances that we will not become a PFIC for the current fiscal year ending on December 31, 2013, or any future year, or that the Internal Revenue Service will not challenge any determination made by us concerning our PFIC status. For a discussion on how we might be characterized as a PFIC and related tax consequences, please see the section of this annual report entitled "U.S. Taxation – Passive Foreign Investment Companies."

Item 4. Information on the Company

4.A History and Development of the Company

Nova Measuring Instruments Ltd. was incorporated in May 1993 under the laws of the State of Israel. We commenced operations in October 1993 to design, develop and produce integrated process control systems for use in the manufacture of semiconductors, also known as integrated circuits or chips.

In April 2000, we conducted an initial public offering and our shares were listed for trading on The NASDAQ Global Market (formally known as The NASDAQ National Market).

In June 2002, we listed our shares on the TASE, pursuant to legislation which enables Israeli companies whose shares are traded on certain stock exchanges outside of Israel to be registered on the TASE, while reporting, in substance, in accordance with the provision of the relevant foreign securities law applicable to the Company.

During 2003, we began expanding our product offerings to include stand-alone systems. In recent years stand-alone metrology has started to account for a significant portion of our overall revenues.

Until 2008, most of our products were sold to process equipment manufacturers such as Applied Materials, Inc. and Ebara Corp., which later sold these products to semiconductor manufacturers. In recent years, however, we have completely changed our business model, selling most of our products directly to semiconductor manufacturers. Through this process, which has also enabled us to introduce to these customers additional products and features, we have improved our products gross margins. In parallel, we continue to work with the process equipment manufacturers as business partners for future products and process control solutions.

On February 9, 2010, we successfully completed an underwritten public follow-on offering of 4,427,500 ordinary shares in consideration of approximately $17.0 million in net proceeds.

We have five fully owned subsidiaries in the U.S., Japan, Taiwan, Korea and the Netherlands. These subsidiaries are engaged in marketing activities and provide technical support to our customers.

Our main office, research and development and production facilities are located in Israel at the Weizmann Science Park, Building 22, 2nd Floor, Ness-Ziona. Our telephone number at our main office is +1-972-73-229-5600.

4.B Business Overview

We are a worldwide leading designer, developer and producer of optical metrology solutions comprised of integrated process control metrology systems as well as stand-alone metrology used in the manufacturing process of semiconductors. Metrology systems measure various thin film properties and critical circuit dimensions during various steps in the semiconductor manufacturing process, allowing semiconductor manufacturers to increase quality, productivity and yields, lower their manufacturing costs and increase their profitability. We supply our metrology systems to major semiconductor manufacturers worldwide. Our systems were first installed in 1995 and, since that time, we have sold more than 2,600 metrology systems.

The semiconductor manufacturing process starts with a flat silicon discs known as silicon wafer, which has been highly polished on one side to a mirror finish, upon which circuits are constructed. To construct the circuits, a series of layers of thin films that act as conductors, semiconductors or insulators are applied to the polished side of the wafer. During the manufacturing process, these film layers are subjected to processes which remove portions of the film layers, create circuit patterns and perform other functions. The semiconductor manufacturing process requires exacting steps and strict control of equipment performance and process sequences. Tight control can be achieved through monitoring silicon wafers and measuring relevant parameters before or after each process step with metrology tools such as those we produce.

Prior to the introduction of our integrated metrology systems, process control was solely achieved through stand-alone measurement equipment. Stand-alone measurement equipment requires semiconductor manufacturers to interrupt the manufacturing process sequence, remove sample silicon wafers from the process equipment and place the silicon wafers on the stand-alone measuring or inspection tool. In contrast, our integrated metrology approach is based upon patented measuring methods that enable us to produce optical measuring systems that are small enough to be integrated directly inside many types of semiconductor process equipment. We believe that in several instances during the manufacturing process, our integrated approach offers considerable advantages over the conventional stand-alone approach to metrology control, enabling manufacturers using our integrated equipment to reduce costs and to improve production efficiency, yield and quality.

We have always emphasized our integrated metrology solutions as this continues to be an area where we have a leading position. In addition, in the past few years, we developed and started manufacturing stand-alone metrology systems, leveraging our technology, methods, metrology expertise and market position in the integrated metrology field to expand our offerings of stand-alone metrology systems. Over the past several years we developed several generations of Stand-Alone metrology tools. Through a customer driven roadmap which aligns our development efforts with both R&D as well as high volume manufacturing needs of our customers, we have been able to build a differentiated product offering. The success of this endeavour has allowed us to grow this aspect of our business such that it now represents a significant part of our overall business. Today, both stand-alone and integrated metrology solutions have reached a level of maturity allowing semiconductor manufactures to choose how to use either technology and make decisions based on merit specific to the process step in question, always balancing between the amount of data attained and the use made of the data for capabilities such as automated process control. Our long-term strategy is focused on advanced metrology and process control solutions where our integrated process control products and stand-alone products are compatible or complementary and used in a customized way to meet specific customer needs.

Demand for metrology systems, whether integrated or stand-alone, is driven by capital equipment purchases by semiconductor manufacturers, which in turn are driven by worldwide demand for semiconductors. Industry data indicates that through the years, the worldwide demand for semiconductors is growing. We believe that this growth in demand will drive demand for process control equipment, including metrology systems, as semiconductor manufacturers add capacity. We also believe that the demand for metrology systems will also be driven by the increasing manufacturing costs of semiconductors and the demands of semiconductor manufacturers for process equipment that provides better film uniformity, shrinking process geometries resulting in increased dimensional control, tool-to-tool matching and within-tool uniformity.

Our Market

Semiconductor Industry and the Metrology Market

The increased use of semiconductors has been accompanied by an increase in their complexity. Due to the creation of new applications and markets for semiconductors, suppliers and manufacturers are faced with an increasing demand for new products that provide greater functionality and higher performance at lower prices. As a result, many new complex materials, structures and processes are being introduced to semiconductor manufacturing. New materials include copper, low-k and high-k dielectrics, silicon-on-insulator, silicon-germanium, strained silicon and raised source/drain. Manufacturers are also increasingly moving toward 300 mm silicon wafers from 200 mm silicon wafers. While 300 mm wafers can yield up to twice as many integrated circuits as 200 mm wafers, larger wafers increase manufacturing challenges. For example, because 300 mm wafers can bend or bow more than twice as much as 200 mm wafers, they are more susceptible to damage. The larger area of 300 mm wafers also makes it more difficult to maintain film uniformity across the entire wafer. Semiconductors also continue to move toward smaller feature sizes and more complex multi-level circuitry. The increase in complexity of semiconductors and the resulting increase in

the complexity and cost of the semiconductor manufacturing process has also been a driver of demand for metrology systems.

The ever-increasing level of complexity and the decrease in feature sizes has also significantly increased the cost and performance requirements of semiconductor fabrication equipment. The cost of wafer fabrication equipment has also increased due to the higher levels of automation being utilized by manufacturers. Thus, semiconductor manufacturers must increase their investment in capital equipment in order to sustain technological leadership, to expand manufacturing capacity and maintain profitability. According to published reports by an industry market research firm, the cost of building a state-of-the-art semiconductor manufacturing facility has grown from approximately $200 million in 1983 to over $4 billion in 2011 for facilities capable of manufacturing 300 mm wafers. We believe that the process control equipment market, which includes the metrology segment, will grow in the future at a rate greater than the overall process equipment market since the challenges of meeting process design goals will become increasingly difficult such that process control equipment is in the future expected to consume a larger portion of the overall costs of semiconductor manufacturing equipment.

The Semiconductor Manufacturing Process

Semiconductors typically consist of transistors or other components connected by an intricate system of circuitry on silicon wafers. Integrated circuit manufacturing involves well over a dozen individual steps, some of which are repeated several times, through which numerous copies of an integrated circuit are formed on a single silicon wafer. Typically, up to 30 very thin patterned layers are created on each wafer during the manufacturing process. At the end of the manufacturing process, the wafer is cut into individual chips or dies. Because semiconductor specifications are extremely exacting, and integrated circuits are becoming more complex, requiring ever more sophisticated manufacturing processes, the process steps are constantly monitored, and critical parameters are measured at each step using metrology equipment.

Many of the manufacturing steps involve the controlled application or removal of layers of materials to or from the wafer. The application of materials to the wafer, known as deposition, involves the layering of extremely thin films of electrically insulating, conducting or semi-conducting materials. These layers can range from one-thousandth to less than one-hundred-thousandth of a millimeter in thickness and create electrically active regions on the wafer and its surface. A wide range of materials and deposition processes are used to build up thin film layers on wafers to achieve specific performance characteristics. One of the principal methods of thin film layer deposition is chemical vapor deposition (CVD). In CVD, a chemical is introduced into the chamber where the wafer is being processed and is deposited using heat and a chemical reaction to form a layer of solid material on the surface of the silicon wafer. Metrology systems monitor the thickness and uniformity of thin film layers during the deposition process.

Once the thin film has been deposited on the wafer to form a solid material, circuit patterns are created using a process known as photolithography. During this process, a light-sensitive coating called photoresist is applied to the wafer, which is then exposed to intense light through a patterned, opaque piece of glass. For the photolithography process to work properly, the thickness of the photoresist must be precise and uniform. In addition, to control the photolithography process, the film thickness, reflectivity, overlay registration and critical dimensions are all measured and verified. The exposed photoresist is developed when it is subjected to a chemical solution. The developed wafer is then exposed to another chemical solution, or plasma, that etches away any areas not covered by the photoresist to create the structure of the integrated circuit. Semiconductor manufacturers use metrology systems to verify the removal of material through the etch process and the critical dimensions of the structures created.

To meet the processing challenges posed by ever smaller feature sizes and because of the use of new materials such as copper in the manufacture of integrated circuits, manufacturers are increasingly using a process technology known as Chemical Mechanical Polishing, or CMP. CMP removes uneven film material deposited on the surface of the wafer from processes such as CVD and photolithography by carefully “sanding” the wafer with abrasives and chemicals, creating an extremely flat and even surface for the patterning of subsequent film layers. Metrology systems are used to control and verify the results of the CMP process by measuring the thin film layer to determine when the correct

thickness has been achieved.

The processes described above are repeated in sequence until the last layer of structures on the wafer has been completed. Each integrated circuit on the wafer is then inspected and its functionality tested before shipment. Measurements taken by metrology systems during the manufacturing process help insure process uniformity and help semiconductor manufacturers avoid costly rework and mis-processing, thereby increasing efficiency and profitability.

The World Economy – Update

Global Insight, the analyst company, forecasts the world GDP to grow by 2.2% in 2013 compared to an increase of 2.2% in 2012, and forecasts the U.S. GDP to grow by 1.9% in 2013.

Gartner Inc. forecasts semiconductor revenues to increase by 4.5% in 2013, compared to a decrease of 3.0% in 2012. In addition, Gartner Inc. forecasts WFE sales in 2013 to decrease by 9.7% following a forecast decrease of 17.4% in 2012.

According to research reports, future demand drivers for semiconductors include Tablet PC's, Smartphones, Netbooks, Solid State Drives (SSD) and other electronic equipment.

The Need for Greater Overall Equipment Efficiency

We believe that one of the major challenges to achieving improvements in semiconductor manufacturing cost efficiency is continuously improving equipment productivity. Overall equipment efficiency, that is, the percentage of time that processing equipment is utilized to produce wafers, is used as a metric to quantify the productivity of a processing tool. The major factors affecting productivity are equipment downtime, qualification time, mis-processing and operator skills. We believe that in order to improve cost productivity, earn an acceptable return on their investment in capital equipment and to meet the demand for improved semiconductor device performance, semiconductor manufacturers must continuously find ways to improve overall equipment efficiency. It is therefore that we continuously ensure that our products offer cost efficient performance in their mode of operation. It is also our understanding that the use of metrology equipment that we manufacture enhances the cost efficiency of the process itself by offering high throughput, high reliability and low cost of operation making the metrology an inherent part of the process which does not cause any unnecessary delays.

Process Control. The steps used to create semiconductors are exacting processes that require strict control of equipment performance and process sequences for the resulting semiconductors to function properly. Tight control is achieved through monitoring of the in-process wafers and by measuring relevant parameters after each process step. These procedures are usually carried out on a small sample of the wafers though in some steps where process stability if difficult to achieve, the number of sampled wafers will increase. The monitoring may include measurement of several parameters, such as the thickness of the layers of thin film deposited, the sizes of the features that are patterned through the photolithography process, as well as the registration or alignment between two consecutive layers, known as overlay. Monitoring also includes inspection of the wafer for irregularities, defects or scratches. If parameters are out of specification or if defects or contamination are present, the manufacturer adjusts the process and measures another sample of wafers thereby allowing manufacturers to reduce costs and improve device performance.

The Need for Effective Process Control Tools. A number of technical and operational trends within the semiconductor manufacturing industry are strengthening the need for more effective process control solutions. These trends include:

- Development of Smaller Semiconductor Features. The development of smaller features, now as small as 28nm in production and 14nm in R&D, enables semiconductor manufacturers to produce larger numbers of circuits per wafer and to achieve higher circuit performance. As feature geometries decrease, manufacturing yields become increasingly sensitive to processing deviations and defects, as more integrated circuits are lost with every discarded wafer. In addition, the increased complexity and number of layers of the integrated circuits increase the chance of error during the manufacturing of the wafer.

- Transition to 3D device structures. Foundries will be adopting 3D FinFET transistors to get improved performance and use less power in 1x technology nodes. Memory makers will move to 3D NAND and vertical structures for next generation NAND technology. These trends will require process control with metrology solutions capable of measuring critical dimensions in these 3D structures that are currently supported only by optical metrology technology.

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Transition to 3D Integration Technology. Three-dimensional (3D) integration of active devices, directly connecting multiple IC chips, offers many benefits, including power efficiency, performance enhancements, significant product miniaturization, and cost reduction. It provides an additional way to extend Moore's law beyond spending ever-increasing efforts to shrink feature sizes. A critical element in enabling 3D integration is the Through-Silicon Via (TSV); TSV provides the high-bandwidth interconnection between stacked chips. The TSV process is now beginning to enter production. In the case of TSV, since multiple chips are connected, the process has to achieve and maintain very high yield levels in order to be economically viable. TSV metrology solution are required to closely monitor and measure depth, side-wall slope, top and bottom diameter (CD), and bottom curvature.

- Shortening of Technology Life Cycles. The technology life cycle of integrated circuits continues to shorten as semiconductor manufacturers strive to adopt new processes that allow a faster transition to smaller, faster and more complex devices. In the past, the technology life cycle was approximately three years; it is now only two years. The accelerating rate of obsolescence of technology makes early achievement of enhanced productivity and high manufacturing yields an even more critical component of a semiconductor manufacturer's profitability and metrology continues to play an even more critical role in achieving these demanding results.

- Transition to Copper and other New Materials. Copper metal layers and other new materials such as low and high k-dielectrics and silicon on insulator are increasingly replacing aluminum for advanced integrated circuits in order to increase performance and reduce the cost of integrated circuits. Copper and low-K materials make it possible to build higher speed devices using fewer layers. The use of copper and other new materials requires new processing and metrology equipment and thus represents challenging developments for the semiconductor manufacturing industry.

- Transition to High-K Metal Gate. In order to overcome limitations in the continued shrink of transistor dimensions, leading edge integrated circuit manufacturers are introducing new materials in the transistor gate stack. The use of high-k dielectrics, combined with metal layers, requires new processing and metrology equipment and thus represents challenging developments for the semiconductor manufacturing industry.

- Increase in Foundry Manufacturing. As a result of the rising investment needed for semiconductor process development and production as well as the proliferation of different types of semiconductors, semiconductor manufacturing is increasingly being outsourced to large semiconductor contract manufacturers, or foundries. A foundry typically runs several different processes and makes hundreds to thousands of different semiconductor product types in one facility, making the maintenance of a constant high production yield and overall equipment efficiency more difficult to achieve. This trend of shifting to foundries for manufacturing needs has progressed even further during recent years.

- Increase in Automation. In an effort to achieve greater operating efficiencies, semiconductor manufacturers are increasingly relying upon automation. Automation represents the fastest growing segment of the semiconductor manufacturing industry.

In order to address the increasing costs associated with these trends, we believe semiconductor manufacturers must enhance manufacturing productivity. One way to enhance productivity is through improvements in process control, with a greater emphasis on metrology as part of process control. As part of this emphasis on metrology, manufacturers are taking more measurements to characterize each step of the semiconductor manufacturing process, new and enhanced measurement techniques are being used to provide meaningful data and the data provided is being used in new ways to enhance the manufacturing process. We believe that the demand for advanced process control systems that address the evolving needs of semiconductor manufacturers will continue to drive the growth in the market for process control systems.

We believe that in certain process steps, integrated metrology systems provide semiconductor manufacturers with the greatest opportunity to increase the productivity and yields of their equipment, thereby increasing their profitability. Therefore, we plan to continue to maintain a major focus on the integrated metrology market. However, recognizing that a significant number of process steps will continue to rely upon stand-alone equipment, we intend to continue leveraging our market leading position in the integrated metrology market and our metrology expertise to deepen our penetration of the stand-alone metrology market. Furthermore, the technological and operational trends within the semiconductor manufacturing industry that are strengthening the need for more effective process control solutions can sometimes be addressed through the use of stand-alone metrology equipment or a combination of both stand-alone and integrated metrology.

Expected equipment spending in 2013

We believe that in 2013 equipment spending will be focused around three main areas:

1. Technology buys of equipment enabling semiconductor manufacturers to move to the next technology node maintaining competitiveness, reducing cost and improving product performance.

2. Expansion within not fully populated fab shells and initial population of new fabs.

3. Retrofits of equipment that will improve yield or efficiency reduce overall manufacturing cost or enable using older process equipment for advanced technology nodes.

Metrology plays an important role in all of the above. We believe that we are well positioned for technology as well as expansion buys and retrofit opportunities with our newer stand-alone products, the NovaScan 3090Next, the Nova T500,the Nova T600 and the Nova v2600 for the TSV market, and our state of the art integrated metrology products, the NovaScan 3090Next IM and the new generation Nova i500.

The Nova Approach

Integrated Metrology

Our integrated metrology systems provide semiconductor manufacturers with effective and efficient process control by measuring wafers and their properties without removing the wafer from the process equipment. All our products use our patented measuring methods that enable us to produce optical measuring systems that are small enough to be incorporated directly inside many types of equipment used in semiconductor processing. Integrated systems measure the wafer within the actual process environment, reducing labor and wafer handling as well as the risk of contamination of or damage to the wafer. In addition, we believe that our systems deliver significant increases in overall equipment efficiency through advanced process control, along with improving wafer-to-wafer uniformity, all with minimal operator intervention.

We provide our customers with flexible integrated process control solutions by offering systems that meet thin film as well as Optical CD measurement needs in critical applications in the fabrication process. Our integrated process control platform can be deployed to multiple processes and applications of semiconductor manufacturing.

Our systems can be installed directly in new equipment or used to upgrade existing equipment with minimal integration costs, extending the useful lifetime of existing process equipment and saving significant capital costs. To our knowledge, only our metrology systems can be used to retrofit older 200 mm semiconductor manufacturing equipment, giving us a unique opportunity as manufacturers seek to increase production quickly to meet the increasing demand for semiconductors. Our pioneering approach, centered on our NovaReady integration package, later adopted by process equipment manufacturers, allows process equipment manufacturers to prepare their equipment to accept our measurement systems, which can then be integrated with a simple plug-and-play installation.

We believe our integrated process control systems and solutions provide several important advantages to semiconductor manufacturers, enabling manufacturers to:

- utilize the process equipment wafer handling system to allow measurement of the sample wafers while processing other wafers and avoid the need for the costly additional wafer handling required by stand-alone metrology systems;

- perform the measurements without removing the wafer from the process equipment, increasing the efficiency of the process and decreasing the risk of contamination;

- reduce manufacturing equipment processing variability through the use of wafer to wafer measurements and closed loop control based on automated feedback of process variability;

- reduce capital costs of the fabrication facility by increasing overall equipment efficiency and reducing labor costs and necessary clean room area;

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reduce the amount of time required to qualify process equipment that is usually idle during qualification steps, thus, minimizing costly equipment down-time;

- reduce the number of test wafers; and
- detect processing errors as early as possible.

We believe that as semiconductor manufacturers demand greater efficiency from their manufacturing equipment, process equipment manufacturers will increasingly seek to offer their customers integrated metrology in their tools to lower costs and increase overall efficiency. We believe the drive toward more efficient manufacturing operations in the face of increasing complexity will continue the trend of adopting integrated metrology solutions such as those we offer to multiple processes.

In prior years, most of our integrated metrology products were sold through process equipment manufacturers (such as Applied Materials, Inc. and Ebara Corporation). These products are later sold by the process equipment manufacturers to the semiconductor manufacturers. In recent years, we have made efforts to sell our integrated metrology products directly to the semiconductor manufacturers, in order to provide more favorable commercial terms to end users, PEM's and our Company as well as deepen our technological cooperation with the end users and expand our product offering through new, and previously unavailable, features and functionality. These efforts resulted in a significant shift towards direct sales of our integrated metrology products since 2009. We can not foresee the long-term impact of a move to direct sales, due to the competitive landscape and overall market conditions.

Stand-Alone Metrology

As stated above, we pioneered the area of integrated metrology and to-date revenues from that product continue to represent the larger portion of our overall revenues. With the adoption of our technology and the formation of long standing relationships with leading manufacturers, we have come to realize that our technology can be extended beyond integrated metrology into areas such as stand-alone metrology. Accordingly, in the past few years we developed stand-alone metrology tools to perform measurements similar to those performed by our integrated metrology tools. The expression "stand-alone metrology" generically describes free standing metrology equipment which sits inline, i.e., next to the processing equipment and receives cassettes or FOUP of wafers to allow sampling of a few or several wafers from each cassette it receives. There are several types of stand-alone metrology tools each of which performs a distinct type of measurement, e.g., defect inspection, electrical performance, microscopic analysis, cross sections, etc. Our specific focus is in the area of optical CD measurement which is generally utilized in order to characterize critical dimensions on a wafer, their width, shape and profile. This technology is utilized today in several areas of the fab such as photolithography, etch, CMP, selective deposition of thin films, etc. The key advantage offered by this technique is that it provides visualization of the full cross-section-like profile of the structure, while remaining non-destructive and extremely fast with very high accuracy and repeatability. Adding stand-alone metrology to our product portfolio has allowed us to expand our reach into areas of the fab that have been slower to adopt integrated metrology or such areas that can be properly controlled with a lower sampling scheme offered by a stand-alone measurement tool.

We introduced this concept in 2006 and we were successful in penetrating several accounts since then, allowing us to see a significant increase in our overall customer base with the stand-alone products. With the introduction of stand-alone metrology, we have expanded our addressable markets and are now able to provide metrology solutions for four of the five critical manufacturing steps, as opposed to the one or two we were previously able to provide, when our product offering was limited.

Our Technology

We believe that our technological and engineering expertise and research and development capabilities allow us to develop and offer new products and technologies to meet the ever-changing demands of the semiconductor industry. We have applied our technological and engineering expertise to develop a wide range of integrated and stand-alone products for the dielectric CMP, copper CMP, Tungsten CMP, Etch and lithography processes as well as high end CVD deposited layers, Cu electroplating and sputtering of Cu barrier and seed materials. Because of our open architecture policy, our integrated metrology solutions can work with most models of CMP and Etch tools made by the major process equipment manufacturers, for both 200 mm and 300 mm applications.

Our scatterometry capabilities have enabled us to penetrate new customers with Stand-Alone Optical CD metrology systems. Our combined offering of advanced measurement hardware and advanced modeling software place us in a position to offer an advantageous solution to our customers.

In addition to the above applications, in 2012, we introduced a stand-alone product for the emerging 3D-interconnect market. This internal development is based on an extension of our existing technologies.

Our suite of technological capabilities includes:

- Broadband Spectrophotometry. Our broadband Spectrophotometry capabilities range from deep ultraviolet to near infrared. This technology enables fast, accurate and small spot size film thickness measurement in a large range of applications on a very cost effective basis, both as an integrated system and as a stand-alone system.

- Scatterometry. Our Scatterometry systems are based on our broadband Spectrophotometry technology. These systems use a fully polarized deep ultraviolet to near-infrared spectral light source. This technology enables fast and cost effective system development. Scatterometry provides two and three dimensional characterization of very fine geometries on patterned product wafers. These profiling and critical dimension capabilities are key enablers of advanced process control, allowing almost real time metrology of the most advanced design rules, down to 14 nm and below. A key component in scatterometry technology is the modeling software which converts raw spectra coming from the measurement tool into useful information in terms of customer parameters. This segment of the technology is where we currently focus our attention and where we have also acquired specific advantages due to our unique solutions. Some of Nova metrology solutions use multi-channel reflectometry to reduce the ambiguity, increase the sensitivity to critical parameters, and improve measurement accuracy. The measurements are gathered using different wave lengths, polarizations and directions in order to deliver highly-accurate results.

- Dark Field Reflectometry - In order to further increase the variety of independent channels, we implemented measurement schemes based on the notion of dark-field (DF) detection. In DF measurements, the optical system is designed so that light going through 'simple' reflection from the sample is blocked before detection. Dark field reflectometry is implemented in Nova’s V2600 for measurements of Through-Silicon-Via (TSV). In order to isolate and highlight the signal related to reflection from TSV side walls, we implemented a dark-field method by which all light specularly reflected from the wafer top surface is blocked, and only light that has entered the via is collected for analysis. This method is beneficial for the characterization of the TSV profile, allowing sensitivity to the via side walls and bottom characteristics.

- Imaging and image processing. One of Nova's key core technologies is high-end optical imaging. As part of this specialty, Nova has implemented advanced image processing algorithms, sophisticated navigational channels, and robust pattern recognition capabilities, in its tools.

The measurement techniques used in our metrology products are unique and protected by a number of patents.

Throughout our history, we have been a technological leader in the integrated metrology field. We were the first to offer integrated metrology solutions for semiconductor manufacturers and are the only provider of integrated metrology solutions that can measure wafers in water, which allows for more efficient and accurate metrology.

Our systems have also been recognized by the industry: in 1998 we received the prestigious Editors’ Choice Best Product Award from Semiconductor International magazine for our NovaScan 420 integrated thickness measurement tool for CMP process monitoring, in 2004 we received the award for our NovaScan 2020Cu and 3030Cu for Copper CMP process monitoring, in 2007 we received the award for our NovaScan 3090CD for thin-film metrology of dielectric CMP and copper applications, CD control and shape profiling and in 2009 we received this award for NovaMARS modeling SW.

Products

Our products include metrology systems for thin film measurement in chemical mechanical polishing and chemical vapor deposition applications; optical CD and Metal Line Thickness (MLT) systems for use in post-copper chemical mechanical polishing applications and optical critical dimension systems for lithography and etch applications. Our integrated thickness monitoring system for chemical mechanical polishing process control enables wafer-to-wafer closed loop control. We offer several models of integrated thickness monitoring systems, depending on polisher type and end-user requirements. These metrology systems address a broad range of metrology requirements of our end-user and process equipment manufacturer customers. Both our integrated and stand-alone systems incorporate patented optical scanning, dynamic auto-focus, unique pattern recognition for arbitrarily oriented wafers and proprietary algorithms for in-water measuring of two layers simultaneously. We offer several different product models that are

tailored to conventional chemical mechanical polishing equipment as well as to newer, high throughput polishers. Following is a summary of our products:

Thin Film Process Control

- The NovaScan 2040 is the second generation of integrated thickness monitoring systems with enhanced spectral range, responding to the needs of the industry for emerging chemical mechanical polishing high-end applications of thin films and complex layer stacks. The 2040 model was introduced to the market at the end of 2000, and since then has replaced the NovaScan 840 and accounted for the majority of our sales for 200 mm production lines since then.

- The NovaScan 2020Cu has the same basic platform as the NovaScan 2040, with additional hardware and software improvements, enabling the system to answer the unique requirements of copper chemical mechanical polishing monitoring. The system was introduced to the market at the beginning of 2003.

- The NovaScan 3090Next is currently our main product. Targeted at 45 nm and 32 nm technology nodes this tool was released in 2006 and provided significant improvements in throughput, accuracy, tool to tool matching and spectral range over the older NovaScan 3090. It also improved overall tool reliability. The NovaScan 3090Next is available as integrated metrology and as stand-alone metrology systems for both thin film and Optical CD (scatterometry) applications.

- The Nova T500 stand-alone product family, targeted at technology nodes ranging from 32nm and smaller than 20nm. The Nova T500 features improved metrology performance, improving both accuracy and tool to tool matching, providing industry leading throughput of 250WPH.

- The new generation Nova i500 integrated metrology features the same metrology as the Nova T500 for complete stand-alone to integrated metrology compatibility. The Nova i500 features advanced metrology for technology nodes smaller than 20nm and high throughput that meets the standards of next generation polishers. The Nova i500 demonstrated more than 30% improvement in throughput, was qualified for high throughput polishers and showed improved precision and tool matching compared to the previous model in various production scenarios.

- The Nova T600 is the latest addition to the stand-alone product family, targeted at technology nodes of 2x and beyond. The Nova T600 features multi-channel reflectometry configuration that is optimized for best sensitivity on small features and critical device parameters, such as measurement of high-aspect-ratio structures. Nova T600 is designed to meet the challenging cost of ownership requirements of semiconductor customers, achieved through a combination of high throughput, Modular Metrology, and the flexibility to optimize optical configuration and tool type to best serve application needs. Nova T600 is aimed in assisting memory manufacturers in developing their next generation cutting edge technology in the 1Xnm tech node.

- The Nova V2600, announced on July 2012, enables chipmakers to accelerate the development and improve production yield of multi-chip integrations that rely on TSVs (Through Silicon Vias). The new Nova V2600 TSV Metrology system, developed in collaboration with device makers, allows accurate measurement of critical TSV features such as side-wall angle, bottom diameter, and bottom curvature. This process control solution delivers complete TSV dimensional metrology in a high-throughput production-ready system for the industry’s transition to 3D integration in production. Nova V2600 collects a dark-field reflectometry spectrum that is highly sensitive to variations in TSV internal structures, and has a unique capability to extend measuring of future TSVs with diameters below 5 microns. Nova V2600 fits into the production-proven Nova Modular MetrologyTM platform that accommodates two metrology units on a single compact frame. This high-throughput platform is recognized for providing superior cost of ownership and operational flexibility.

- NovaMars is an advanced scatterometry modeling and application development software tool enabling complex 2D, 3D and in-die measurements. Process engineers can harness the power and flexibility of the tool to develop their own scatterometry applications by themselves thus keeping the details of their process within the fab. Its user interface and high level of automation provide for easier and faster application development and eliminate discrepancies between different developers, enabling the best solution, independent of user proficiency. Combined with the NovaMARS innovative modeling software capabilities, the Nova T600, for example, provides the metrology precision and accuracy as well as application development flexibility needed for the development of most advanced technology nodes. The NovaMars is an integral part in all Nova integrated and stand alone solutions.

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A closed loop control option for the NovaScan systems delivers reliable, highly automated wafer-to-wafer uniformity over chemical mechanical polishing manufacturing processes. The thickness data of every processed wafer is obtained and process parameters are fed back to adjust the next wafer polish.

- Nova Fleet Management is Nova's newest solution for managing large fleets of metrology tools and is designed to address the needs and working methodologies of Metrology and Process Engineers in the fab. The solution offers an easy and intuitive platform for managing and improving the overall productivity of Nova systems. Comprised of a centralized server dedicated for databases and data storage, network-connected tools and servers, Nova Fleet Management serves as the back-end platform that enables Wafer-less Recipe Creation (WRC) for simple and intuitive recipe creation without interfering with tool operation. It also supports distribution of recipes from a central location to multiple tools over the fab network in efficient and secure mechanism. The centralized server contains an advanced report generator for the analysis of the metrology spectral data collected from the tools as well as tool performance and health monitoring to ensure that your tools are operating within specifications and enabling you to monitor tools' performance trends.

- NovaNet is a highly sophisticated computer network, connecting all NovaScan systems on a factory floor. The network is managed by a dedicated server, running with proprietary software developed by Nova, and insuring safe recipe distribution and recipe integrity across the factory. The NovaNet also includes a report generator (NSA) that allows the creation of reports from all the systems connected and allows programmable cross sections.

- NovaHPC (High Power Computer) supports the NovaMars Application Development Tool and enables effective and timely calculations of attained spectra. Scalable and user configurable infrastructure with Nova's proprietary task management software addresses the growing needs of IC manufacturing metrology. NovaHPC is just one of the few solutions available for cost effectiveness and computation power growth flexibility. The stand-alone modular rack includes:

  - HPC
    - § TurboHPC
    - § Grid computing connectivity enabled
    - § Web-based management SW

NovaHPC Value-Added Benefits include: accelerated recipe set-up library building, Scalable infrastructure, invest as you grow and Low-cost entry level using grid computing with existing computation resources.

While we continue to emphasize our integrated metrology solutions, we offer our products as stand-alone equipment as well, thereby significantly expanding our potential available markets. While we have succeeded in penetrations of stand-alone metrology, our revenues remain substantially dependent on sales of our CMP integrated metrology product line.

Research and Development

We have assembled a core team of experienced scientists and engineers who are highly skilled in their particular field or discipline. Our research and development core competencies, technologies and disciplines are in scatterometry, thin film metrology, and include measurement instruments, optical modeling, image acquisition, pattern recognition, equipment integration and fab automation. Our research and development staff consists of about 118 highly skilled members, over 38 of which hold Ph.D's. In addition, we rely on independent subcontractors and consultants in various fields. Since June 2003, our research and development operations are certified as ISO9001/2000 quality standard.

The metrology and process control market is characterized by continuous technological development and product innovations. We believe that the rapid and ongoing development of new products and enhancements to our existing product lines is critical to our success. Accordingly, we devote a significant portion of our technical, management and financial resources to developing new applications and emerging technologies. In 2010, 2011 and 2012, our research and development expenses, net of participation by the Office of the Chief Scientist of the Ministry of Industry, Trade and Labor, were $12.4 million, $18.7 million and $ 24.6 million respectively, representing, 14.4%, 18.2% and 25.6% of our respective total revenues for those years. The significant increase of R&D expenditures in 2012 represents our strategic choice to increase our market share in the growing Optical CD market as well as to develop new products beyond our existing fields. In the future, we plan to continue and expand our R&D investments in this area.

Our vision is to continue to be a market leader in the semiconductor process control market, increase our leadership in integrated metrology solutions and become the leader in the stand-alone Optical CD metrology market, and our research and development efforts and activities are designed to support this vision. Our research and development policy is based on a structured process of initiating new projects and on-going review of existing development projects. Project initiation is based on a detailed project plan, risk and market analysis. Each project is monitored throughout its life cycle in a structured process, including design reviews and project management reviews. In the frame of our research and development activities we consider from time to time entering into intellectual property consortium arrangements. In 2012 we entered into several intellectual property consortiums, both in Israel and in Europe, in order to be able to support our customers in the expected 450mm wafer processing technology transition in the coming years.

Intellectual Property

Our success depends in part upon our ability to protect our intellectual property. We therefore have an extensive program devoted to seeking patent protection for our inventions and discoveries that we believe will provide us with competitive advantages. As of February 15, 2013, our portfolio includes about 100 U.S. patents and approximately 40 non-U.S. patents. The U.S. patents we hold have expiration dates ranging from 2014 to 2025. We also have 21 U.S. patent applications pending and about 30 applications pending in other countries including 6 PCT applications. Our patents and applications principally cover various aspects of optical measurement systems and methods, integrated process control implementation concepts, and optical, opto-mechanical and mechanical design. We have also registered 4 trademarks in the U.S. and 10 registered trademarks in countries other than the U.S.

To protect our proprietary rights, we also rely on a combination of copyrights, trademarks, trade secret laws, contractual provisions and licenses. Our copyrights include software copyrights. We also enter into confidentiality agreements with our employees and some of our consultants, business partners and customers, and seek to control access to and distribution of our proprietary information, such as our proprietary algorithms.

While we attempt to protect our intellectual property through patents, copyrights and non-disclosure and confidentiality agreements, we may not be able to adequately protect our technology. Competitors may be able to develop similar technology independently or design around our patents and, despite our efforts, our trade secrets may be disclosed to others. Furthermore, the laws of countries other than the U.S. may not protect our intellectual property to the same extent as the laws in the U.S. We also cannot assure that: (i) our pending patent applications will be approved; (ii) any patents granted will be broad enough to protect our technology or provide us with competitive advantages or will not be successfully challenged or invalidated by third parties; or (iii) that the patents of others will not have an adverse effect on our ability to do business. We may also have to commence legal proceedings against third parties to protect our intellectual property, as we have done recently.

From time to time, we receive communications from others asserting that our products infringe or may infringe their intellectual property rights. Typically, our in-house patent counsel investigates these matters and, where appropriate, retains outside counsel to provide assistance. We are not presently involved in any material legal proceedings in which a third party has asserted that we have violated their intellectual property rights. If, however, we become involved in any such litigation and its outcome is adverse to us, it may result in a loss of proprietary rights, subject us to significant liabilities, including treble damages in some instances, require us to seek licenses from third parties which may not be available on reasonable terms or at all, or prevent us from selling our products. Furthermore, any litigation relating to intellectual property, even if we are ultimately successful, could result in substantial costs and diversion of time and effort by our management. This in and of itself could have a negative impact on us.

While we believe that we would be successful in any litigation seeking to enforce our patent rights, the ultimate outcome of any litigation or other legal proceedings cannot be predicted.

In September 2006, we invited companies to submit bids to license or buy some of our patents. These patents have substantial value because the industry is on the threshold of widespread adoption of integrated metrology and the methods covered by the patents are critical for advanced manufacturing of semiconductors. We were pioneering the use of an auction model to set a market price for patent licenses by offering to the highest bidder licenses for six of our patents pertaining to the use of a lithography tool with integrated metrology in semiconductor processing lines. Participants in the auction also had the option to bid for full ownership of the patents, which represent only a small portion of Nova’s extensive patent portfolio.

In July 13, 2007, Nova reached an agreement to license the patents to a large semiconductor manufacturer for a total consideration of more than $1.0 million.

In addition to the successful monetizing of some our patents in 2007 by non-exclusive licensing to a large semiconductor manufacturer for more than $1.0 million, in June 2009 we initiated another intellectual property monetizing project, by offering several relevant companies to license or acquire an extended number of our patents. Although initial contact with potential customers had been made, our efforts did not yield a definitive transaction, in part due to the deep downturn the whole intellectual property monetizing market has been experiencing. As a result, as of December 2010 we have formally terminated this process. For additional information regarding our intellectual property, see "— Our Technology" in this annual report on Form 20-F.

Our Customers, Sales and Marketing

Our two pronged, integrated sales and marketing strategy involves marketing our products directly to semiconductor manufacturers in addition to process equipment manufacturers in order to create demand for our products. We believe that the pricing structure of our NovaReady integration package enables process equipment manufacturers to increase their margins, and that the features and benefits of our systems can improve equipment yields, overall equipment efficiency and increase productivity, creating an incentive for process equipment manufacturers to promote our products to semiconductor manufacturers. At the same time, we believe that semiconductor manufacturers, eager to improve their own margins through increased factory throughput and yield improvements, will demand that the equipment they employ incorporate or use metrology systems such as those we manufacture. We believe that by marketing directly to end users as well as to process equipment manufacturers, we are able to ensure that both parties are aware of the wide range of benefits that our products can deliver, and that we are able to continuously enhance our products with functionality demanded by these two distinct types of customers.

To further enhance our marketing efforts, we have established a system of integrated sales and support activities with key process equipment manufacturers. This allows us to provide comprehensive and long-term application support directly to semiconductor manufacturers and ensure that our products are combined into our partners' next generation equipment sets as those become available. We expect to continue to add new process equipment manufacturers as partners as we introduce new integrated process control systems that can be integrated with different types of equipment.

We also seek to establish and maintain close and mutually beneficial relationships with our customers by consistently providing them with a high level of service, support and new capabilities. We have established a global network of direct sales and marketing, customer service and applications support offices. We maintain sales, service or applications offices in Europe, Israel, Japan, Korea, Singapore, Taiwan, China and the U.S., with a total staff of 122 people. These offices provide highly qualified application support specialists, training to process equipment manufacturer customers and end users, marketing, demonstrations and evaluations, spare parts hubs and sales and support engineers.

We serve all sectors of the integrated circuit manufacturing industry including logic, ASIC, foundries and memory manufactures. Our end user and process equipment manufacturer customers are located in different countries, including Japan, Korea, Singapore, Taiwan, China the U.S. and various European countries.

The table below describes the distribution of our total revenues, from systems and services, according to the geographic location of the actual installation of our systems in end-user sites:

	Year ended December 31,		
	2010	2011	2012

	(in thousands)		
U.S.	$ 14,373	$ 20,230	$ 22,097
Europe	2,409	7,818	6,076
Japan	3,378	3,372	942
Asia-Pacific (excluding Japan)	66,460	71,408	67,053
Total	$ 86,620	$ 102,828	$ 96,168

The semiconductor industry is dominated by a small number of large companies. As a result, while our overall customer base is diverse, our sales are highly concentrated among a relatively small number of customers. The following table indicates the percentage of our total revenues derived from sales to our five largest customers and the range of these revenues from these customers for the periods indicated.

	Year ended December 31,		
	2010	2011	2012
Total revenues from five largest customers	78%	58%	72%
Range of revenues from five largest customers	8%-24%	6%-29%	5%-41%

We anticipate that our revenues will continue to depend on a limited number of major customers, although the companies considered to be our major customers and the percentage of our revenue represented by each major customer may vary from year to year. As our customer base is highly concentrated, if any of our customers becomes insolvent or has difficulties meeting its financial obligations to us, we may suffer losses that may be material in amount. A loss of any of our major customers may likewise cause us to suffer a material decrease in sales and revenue.

The highly competitive nature of the market for semiconductor capital equipment affects our ability to successfully implement our marketing and sales efforts. Competitive factors in the market for integrated process control systems include technological leadership, system performance, ease of use, reliability, cost of ownership, technical support and customer relationships. For integrated process control, an adequate business model, internal organization and unique process equipment manufacturer agreements and partnerships are also significant factors. We believe we compete favorably on the basis of these factors in the markets we serve.

Our current integrated metrology products primarily compete with products manufactured by Nanometrics. We have gained market share with the successful launch of NovaScan 3090 platform but we expect our integrated products to face intense competition in the coming years. In the stand-alone metrology field, we face intense competition in, from both Nanometrics and KLA-Tencor. We also compete against companies manufacturing other types of equipment as a result of the disruptive nature of the technology we offer. These companies include Hitachi hi-tech and Applied Materials in the area of CD-SEM and Rudolph Technologies in the area of acoustic measurement of copper lines.

Manufacturing

In order to leverage the relatively high volume of integrated and stand-alone systems we manufacture, and in order to decrease production costs, we continue to focus our internal manufacturing activities on processes that add significant value or require unique technology or specialized knowledge and outsource others. Our manufacturing operations received the ISO 9001 quality mark by an international certification institute in October 1999. Since then, we have upgraded our quality systems to conform to ISO 9001/2008 requirements. In 2010, we received the formal certification of ISO 14001:2004.

Our principal manufacturing activities include assembly, integration, final testing and calibration. Our production activities are conducted in our manufacturing and Repair Center facility in Israel. We rely and expect to continue to rely on subcontractors and turnkey suppliers to fabricate components, build subassemblies and perform other non-core activities in a cost-effective manner. While we use standard components and subassemblies wherever possible, most mechanical parts, metal fabrications, optical components and other critical components used in our products are engineered and manufactured to our specifications. A small portion of these components and subassemblies are obtained from a limited group of suppliers, and occasionally from a single source supplier.

We have our own manufacturing facility, which is located in Ness-Ziona, Israel, divided into two buildings. Any event affecting this facility, including natural disaster, labor stoppages or armed conflict, may disrupt or indefinitely discontinue our manufacturing capabilities and could significantly impair our ability to fulfill orders and generate revenues.

Capital Expenditures

Our capital expenditures are primarily for network infrastructure, computer hardware and software, leasehold improvements of our facilities and system demonstration and development tools. None of these assets are held as collateral or guarantee other obligations. For additional information on our capital expenditures, see “Item 5B. Liquidity and Capital Resources” in this annual report on Form 20-F.

Political and Economic Conditions in Israel

We are incorporated under the laws of the State of Israel, and our principal offices and manufacturing facilities are located in Israel. We are, therefore, directly influenced by the political, economic and military conditions affecting Israel. Any major hostilities involving Israel, the interruption or curtailment of trade between Israel and its trading partners or a significant downturn in the economic or financial condition of Israel could have a material adverse effect on our business, financial condition and results of operations. Additionally, many of our male employees in Israel are currently obligated to perform annual reserve duty in the Israel Defense Force and virtually all such employees are subject to being called to active duty at any time under emergency circumstances. While we have operated effectively under these requirements since we began our operations, no assessment can be made as to the full impact of such requirements on our workforce or business if conditions should change, and no prediction can be made as to the effect of the expansion or reduction of such obligations.

Government Regulation

For information relating to the impact of certain government regulations on our business, see “Item 5C –Grants from the Office of the Chief Scientist” on this annual report on Form 20-F.

4.C Organizational Structure

Our Subsidiaries

Our subsidiaries and the countries of their incorporation are as follows. All of our subsidiaries are wholly owned by the Company:

Name of Subsidiary	Country of Incorporation
Nova Measuring Instruments Inc.	Delaware, U.S.
Nova Measuring Instruments K.K.	Japan
Nova Measuring Instruments Taiwan Ltd.	Taiwan
Nova Measuring Instruments Netherlands B.V.	Netherlands
Nova Measuring Instruments Korea Ltd.	Korea

4.D Property, Plant and Equipment

Our main facilities, located in Ness-Ziona, Israel, occupy approximately 6,900 square meters, including: approximately 1,200 square meters of production facilities, approximately 4,500 square meters of research and development offices (including approximately 400 square meters of laboratories) and approximately 1,200 square meters of headquarters, sales and marketing, service and support and administration facilities. In 2013 we expect to occupy an additional space of approximately 1,340 square meters. For a summary of the main terms of our lease agreements, see Exhibit 4.7 to this annual report on Form 20-F.

Our subsidiaries lease offices in various locations, for use as a service and pre-sale facility. Our U.S. subsidiary leases approximately 300 square meters, our Japanese subsidiary leases approximately 34 square meters, our Taiwanese subsidiary leases approximately 640 square meters and our Korean subsidiary leases approximately 340 square meters.

We believe that our facilities and equipment are in good operating condition and adequate for their present usage.

Item 4A. Unresolved Staff Comments

None.

Item 5. Operating and Financial Review and Prospects

Information in this Operating Review and Financial Prospects Section should be read in conjunction with our consolidated financial statements and notes thereto which are included elsewhere in this report.

Executive Overview

We are a worldwide leading designer, developer and producer of integrated metrology systems for the semiconductor manufacturing industry and a leading designer, developer and producer of stand-alone metrology systems for the semiconductor industry. Our metrology systems are used to take precise measurements of semiconductors during the manufacturing process to control the manufacturing process and increase the productivity of the manufacturing equipment. We market and sell our metrology systems to semiconductor process equipment manufacturers and directly to semiconductor manufacturers.

Our business is greatly affected by the level of spending on capital equipment by semiconductor manufacturers. Capital expenditures by semiconductor manufacturers tend to be cyclical in nature and depend on numerous factors, many of which are beyond our control. Such factors include, inter alia, general economic conditions throughout the world and the demand and perceived demand for semiconductors. In addition, demand for our products and services is affected by the timing of new product announcements and releases by us and our competitors, market acceptance of our new or enhanced products and changes or advances in semiconductor design or manufacturing processes.

In the recent five years (2007-2012), we were able to present positive Cumulative Annual Growth Rate (CAGR) of approximately 10%, while Wafer Fab Equipment ("WFE") experienced negative CAGR of approximately 1%. We believe that this improved performance is attributed mainly to our focus on high growth segments of metrology and Optical CD and to our move to a direct sales business model. Industry forecasts indicate flat to modest increase in WFE spending in the next two years, and we believe we are well positioned to continue to grow as we continue our focus on high growth segments within the industry.

We derive our revenues principally from sales of our metrology systems and services relating to our systems. In 2012, product sales accounted for approximately 80% of our total revenues and services accounted for approximately 20%. Presently, we have no significant long-term debt, and during 2012 we increased our overall cash reserves by $4.3 million, through generating positive cash flow from operating activities. As of the end of 2012, we had overall cash reserves of $91.4 million and working capital of $106.3 million.

Our service organization is operated on a profit and loss basis and is measured as a cost center in each territory and on a global basis. The objectives of our service organization are defined and measured by: customer satisfaction; quality parameters, such as time to repair and mean time between failures; and by profit and loss criteria. The service organization provides support to all products we sell, during both the warranty period and the post warranty period.

When evaluating the performance of the Company, our management tends to focus on several financial metrics and qualitative areas, including market share, gross margins, operating margins, inventory turns and days sales outstanding. Blended gross margins in 2012 were approximately 53%, while product sales presented gross margins of approximately 59% and services presented gross margins of approximately 30%. Our average inventory levels in 2012 were approximately 17% of annual sales. In 2012, average daily sales outstanding for total revenues were 58 and ranged between 54 and 66 days over the four quarters of 2012.

Significant Events in 2012 and Outlook for 2013

The year 2012 had several significant events:

- Nova’s product business again exceeded industry performance.
- Significant growth of foundry business mitigating the impact of softness in the memory side of Nova’s business.
- Extending proliferation of stand alone metrology tools into existing customers
- Significant adoption of Nova’s latest products:
  - NovaT600 and Nova i500 – selected for 1X and 2X technology nodes.
- First shipment of 450mm tool to major PEM (Process Equipment Manufacturer) partner for early development.

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- Very successful new product introduction of the Nova V2600 for the 3D Interconnect market, positioning Nova well for market leadership once the industry moves to high volume manufacturing:
  - Multiple orders and installations at multiple customers.
  - Several interactions with additional customers for further proliferation during 2013.
  - Product utilizes patent pending differentiated capability.
- Deep collaboration with multiple research institutes and customer technology development teams, utilizing a variety of Nova's products, leading to Nova's repositioning as a partner for long term technology development.
  - More than 80% of revenues during 2012 coming from technology nodes below 30nm.
  - Several joint publications with technology leading customers at industry symposiums.

In 2013, Nova plans to focus on the following:

- Excellent execution of the ramp up of the 28nm technology node at leading foundry customers.
- Support the initial ramp up of the 20nm technology node at foundries.
- Support our customers' transition to 3D device structures (both in memory and foundry sectors) to enable them to move to high volume manufacturing of advanced technology nodes.
- Continued collaborations and joint research with leading semiconductor manufacturers and relevant leading research institutes.
- Several new product introductions to extend the company's market leadership of the integrated process control market.
- Advance further with customer and PEM collaborations for the development of 450mm wafer size.
- Several joint publications with technology leading customers at industry symposiums.

The challenges and risks we face in meeting our plans include:

- On time delivery of "the right" process control solutions to meet the needs of our existing and new customers.
- Correctly understanding the market trends and competitive landscape to ensure our products retain proper differentiation to win customer confidence.
- Creating aggressive and competitive roadmap deliverables at reasonable costs in order to properly control expenses.

In order to address these risks and challenges, we are working closely with leading customers' process development groups and with the leading process equipment manufacturers as well as with leading technology research institutes. The purpose of working closely with these entities is to receive from them as early as possible information and feedback on their current and future metrology and process control needs and tune the roadmap to support such needs.

We believe our business performance continues to be better than the industry as a whole. Reflecting back on our performance over the past five years, we see that our compound annual growth rate for the period between 2007-2012 was approximately 10%, while wafer fab equipment reduced by approximately 1%. This performance by Nova also exceeds that of the entire process control sector which was around 6% for that period. Furthermore, Nova's strong and continued penetration into the growing foundry segment has yielded a CAGR of approximately 46% for the said period, while overall wafer fab equipment for the foundry segment only grew by approximately 18%.1

1 Based on Nova's data and Gartner Inc.'s data of 2012 Q4.

It is our belief that we have been able to consistently do better than others as a result of a combination of factors:

- Optical CD has become an enabler for the entire industry over the last few years
- Nova's Optical CD solutions are best of breed combining the best cost of ownership with the best metrology capabilities and advanced features and functionality
- Our integrated process control solutions are adopted widely
- Our solutions are disruptive and have caused customers to change their process control schemes in favor of the ones provided by Nova

Understanding the industry's challenges for the next several technology nodes, it is our belief that we should continue to outgrow the industry going forward as the adoption of our solutions increases as a function of process complexity. We believe that our served addressable markets are continuously expanding as we penetrate more steps of the semiconductor manufacturing process.

Critical Accounting Policies

Our discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements, which have been prepared in accordance with accounting principals generally accepted in the United States of America. We believe the following critical accounting policies, among others, affect our more significant judgments and estimates used in the preparation of our consolidated financial statements.

Use of Estimates – General

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Revenue Recognition

We recognize revenues from the sale of products when all the following criteria have been met: a persuasive evidence of an arrangement exists, delivery has occurred, the price is fixed or determinable, collection of resulting receivables is probable and there are no remaining significant obligations.

For transactions containing multiple elements, revenue is recognized upon delivery of the separate elements, based on their relative fair value. The Company determines the selling price using vendor specific objective evidence ("VSOE"), if it exists, and otherwise uses estimated selling price ("ESP"). Third Party Evidence ("TPE") is not typically used to determine selling prices as to limited availability of reliable competitor products' selling prices. The ESP is established considering multiple factors including, but not limited to, gross margin objectives, pricing strategies, internal costs and other economic conditions. These factors are subjective in nature and any changes in these factors will affect the ESP and as a consequence revenues recognized.

Service contracts generally specify fixed payment amounts for periods longer than one month, and are recognized on a straight line basis over the term of the contract.

Inventories Write-Off

We carry our inventory at the lower of either the actual cost or the current estimated market value of the inventory. We regularly review inventory quantities on hand and record a provision for excess and obsolete inventory based primarily on our estimated forecast of product demand and production requirements for the next twelve months. As demonstrated during 2008, demand for our products can fluctuate significantly. A significant increase in the demand for our products could result in a short-term increase in inventory purchases while a significant decrease in demand could result in an increase in the amount of excess inventory quantities on hand, which could lead to losses. In addition, our industry is characterized by rapid technological change, frequent new product developments, and rapid product obsolescence that could result in an increase in the amount of obsolete inventory quantities on hand. Additionally, our estimates of future product demand may prove to be inaccurate, in which case we may have understated or overstated the provision required for excess and obsolete inventory. In the future, if our inventory is determined to be overvalued, we would be required to recognize such costs in our cost of goods sold at the time of such determination. Likewise, if our inventory is determined to be undervalued, we may have over-reported our costs of goods sold in previous periods and would be required to recognize such additional operating income at the time of sale. Therefore, although we make every effort to ensure the accuracy of our forecasts of future product demand, any significant unanticipated changes in demand or technological developments could have a significant impact on the value of our inventory and our reported operating results.

For a discussion of other significant accounting policies used in the preparation of our financial statements and recent accounting pronouncements, see Note 2 to our consolidated financial statements contained elsewhere in this report.

5.A Operating Results

Overview

The table below describes the distribution of our total revenues, from systems and services, by geographic areas of our product installations at semiconductor manufacturing facilities. As our customers include both semiconductor manufacturers and process equipment manufacturers, this distribution is different from the distribution of our revenues by customer location discussed in the immediately preceding paragraph.

	2010		2011		2012	
USA	16	%	20	%	23	%
Europe	3	%	8	%	6	%
Japan	4	%	3	%	1	%
Asia-Pacific (excluding Japan)	77	%	69	%	70	%
Total	100	%	100	%	100	%

Historically, a substantial portion of our revenues has come from a small number of customers. In 2010, 2011 and 2012 our five largest customers accounted for 78%, 59% and 72% of our revenues, respectively. In 2010, 2011 and 2012 our single largest customer accounted for 24%, 29% and 41% of our revenues, respectively. We anticipate that our revenues will continue to depend on a limited number of major customers, although the companies considered being major customers and the percentage of our revenue represented by each major customer may vary from period to period. Therefore, the loss of any one of our major customers could materially and adversely affect us.

The sales cycle for our systems typically ranges from 6 to 12 months and depends upon the status of our system's integration with a particular manufacture and model of process equipment, the evaluation criteria of our customers, and the technology or application of the process. Additionally, the rate and timing of customer orders may vary significantly from month to month as a function of the specific timing of fab expansions. Accordingly, if sales of our products do not occur when we expect or we are unable to adjust our estimates on a timely basis, our expenses and inventory levels may fluctuate relative to revenues and total assets. In 2012, our inventory levels at the end of each quarter ranged from $13.3 million to $19.4 million. We schedule production of our systems based upon order backlog and customer forecasts. We include in backlog only those orders to which the customer has assigned a purchase order number and for which delivery has been specified.

Our revenues decreased by 7% in 2012 following an increase of 19% and 120% increase in 2011 and 2010, respectively.

The following table shows the relationship, expressed as a percentage, of the listed items from our consolidated statements of operations to our total revenues for the periods indicated:

	Percentage of Total Revenues Year ended December 31,		
	2010	2011	2012
Revenues from product sales	82.9 %	83.2 %	80.3 %
Revenues from services	17.1 %	16.8 %	19.7 %
Total revenues	100 %	100 %	100 %
Cost of products sale	33.5 %	32.9 %	33.0 %
Cost of services	11.7 %	10.7 %	13.8 %
Total cost of revenues	45.3 %	43.6 %	46.8 %
Gross profit	54.7 %	56.4 %	53.2 %
Operating expenses:			
Research and development expenses, net	14.4 %	18.2 %	25.6 %
Sales and marketing expenses	11.7 %	11.1 %	12.5 %
General and administrative expenses	3.4 %	3.1 %	4.1 %
Total operating expenses	29.5 %	32.4 %	42.2 %
Operating profit	25.2 %	24 %	11 %
Financing income, net	0.4 %	0.9 %	1.4 %
Income before income taxes	25.6 %	24.9 %	12.4 %
Income tax expenses (benefit)	-	(2.4)%	0.1 %
Net income	25.6 %	27.3 %	12.3 %

Comparison of Years Ended December 31, 2012 and 2011

Revenues. Our revenues in 2012 decreased by $6.7 million, or 6.5%, compared to 2011, with revenues attributable to product sales accounting for $77.2 million, a decrease of $8.4 million, or 9.8%, compared to 2011, and revenues attributable to services accounting for $18.9 million, an increase of $1.7 million, or 9.8%, compared to 2011. The decrease in product sales revenue in 2012 was attributed to a decrease in capital spending throughout the industry during the second half of the year. The increase in services revenues is attributed mainly to the increase in our products' install base and the related sales of service contracts.

Cost of Revenues and Gross Profit. Cost of revenues consists of labor, material and overhead costs of manufacturing our systems, and the costs associated with our worldwide service and support infrastructure. It also consists of inventory write-offs and provisions for estimated future warranty costs for systems we have sold. Our cost of revenues attributable to product sales in 2012 was $31.7 million, a decrease of $2.1 million, or 6.1%, compared to 2011. Our cost of revenues attributable to product sales, as a percentage of product revenues in 2012, was 41.1%, compared to 39.5% in 2011. Our gross margin attributable to product revenues in 2012 was 58.9%, compared to 60.5% in 2011.

This decrease in gross margins in 2012 is mainly related to expenses which remain fixed while sales volumes decrease. Our cost of revenue attributable to service, as a percentage of service revenues in 2012, was 70.1%, compared to 64.0% in 2011. Our gross margin attributable to service revenues in 2012 was 29.9%, compared to 36.0% in 2011. The decrease in service gross margins in 2012 is mainly related to the increase in employee related costs.

Research and development expenses, net, consist primarily of salaries and related expenses and also include consulting fees, subcontracting costs, related materials and overhead expenses, after offsetting grants received or receivable from the Office of the Chief Scientist. Our net research and development expenses increased by 31.7% to $24.6 million in 2012, compared to $18.7 million in 2011, after offsetting grants received or receivable from the Office of the Chief Scientist of $1.7 million in 2012 and $2.2 million in 2011. In 2012, net research and development expenses represented 25.6% of our revenues compared to 18.2% of our revenues in 2011. This increase in research and development expenses is mainly attributed to an increase in headcount and subcontractors to support our products roadmap. We expect to continue and expand our annual research and development efforts and expenses during 2013 in order to support the wider market opportunities that we see ahead of us, albeit with marginal headcount increase expected during the year.

Approximately 50% of our net research and development expenses in 2012 resulted from our research and development efforts relating to current products and product lines, and the rest were related to developing a technology infrastructure for next generation metrology tools and SW platforms and features.

Sales and Marketing. Sales and marketing expenses are mainly comprised of salaries and related costs for sales and marketing personnel, travel related expenses and overhead. They also include commissions to our representatives and sales personnel. Our sales and marketing expenses increased by 5.5% to $11.9 million in 2012, compared to $11.4 million in 2011. The increase in sales and marketing expenses is mainly attributed to the increase in headcount during 2012. Sales and marketing expenses represented 12.5% and 11.1% of our revenues in 2012 and 2011, respectively. The increase as a percentage of revenue is related to the increase in expenses which was coupled with the decrease in revenues in 2012.

General and Administrative. General and administrative expenses are comprised of salaries and related expenses and other non-personnel related expenses such as legal expenses. Our general and administrative expenses increased by 2.3% to $3.9 million in 2012, compared to $3.2 million in 2011. This increase in mainly attributed to increase in consulting costs relating to legal and financial matters. General and administrative expenses represented 4.1% and 3.1% of our revenues in 2012 and 2011, respectively. The increase as a percentage of revenue is mainly related to the increase in expenses which was coupled with the decrease in revenues in 2012.

Income Tax Expenses. Income tax expenses are comprised of current tax expenses and deferred tax expenses/income. We recorded $0.1 million of income tax expenses compared with $2.5 million of income tax benefit in 2011. This change is mainly attributed to the change in deferred tax assets which is based on management estimation regarding future profitability amounts and timing.

Comparison of Years Ended December 31, 2011 and 2010

Revenues. Our revenues in 2011 increased by $16.2 million, or 18.7%, compared to 2010, with revenues attributable to product sales accounting for $85.6 million, an increase of $13.8 million, or 19.2%, compared to 2010, and revenues attributable to services accounting for $17.3 million, an increase of $2.4 million, or 16.4%, compared to 2010. The increase in product sales revenue in 2011 was attributed to a combination of the growth in capital spending throughout the industry during the first half of the year and successful customer penetrations generating repeat orders. The increase in services revenues is attributed mainly to the increase in our products' install base and the related sales of parts and repair.

Cost of Revenues and Gross Profit. Cost of revenues consists of labor, material and overhead costs of manufacturing our systems, and the costs associated with our worldwide service and support infrastructure. It also consists of inventory write-offs and provisions for estimated future warranty costs for systems we have sold. Our cost of revenues attributable to product sales in 2011 was $33.8 million, an increase of $4.7 million, or 16.3%, compared to 2010. Our cost of revenues attributable to product sales, as a percentage of product revenues in 2011, was 39.5%, compared to 40.5% in 2010. Our gross margin attributable to product revenues in 2011 was 60.5%, compared to 59.5% in 2010. This increase in gross margins in 2011 is mainly related to the overall increase in sales volume utilizing an already existing infrastructure combined with higher margin products sales.

Our cost of revenues attributable to services in 2011 was $11.0 million, an increase of $0.9 million, or 8.8%, compared to 2010. This increase is mainly attributable to the increase in headcount. Our gross margin attributable to services revenues in 2011 was 36%, compared to 31.6% in 2010 as a result of higher revenues utilizing an already existing infrastructure.

Our overall gross profit increased by 22.3% to $58.0 million in 2011, compared to $47.4 million in 2010. Our overall gross margin was 56.4% and 54.7% of our total revenues in 2011 and 2010, respectively. The increase in overall gross margins in year 2011 is mainly attributable to the increase in revenues resulting from the overall growth in semiconductors equipment market, to the sale of higher margin products and to the increase in sales of service parts and repairs.

Research and Development Expenses, Net. Research and development expenses, net, consist primarily of salaries and related expenses and also include consulting fees, subcontracting costs, related materials and overhead expenses, after offsetting grants received or receivable from the Office of the Chief Scientist. Our net research and development expenses increased by 50.1% to $18.7 million in 2011, compared to $12.5 million in 2010, after offsetting grants received or receivable from the Office of the Chief Scientist of $2.2 million in each of the years 2011 and 2010. In 2011, net research and development expenses represented 18.2% of our revenues compared to 14.4% of our revenues in 2010. This increase in research and development expenses is mainly attributed to the continuous increase in headcount to support our products roadmap and to the increase in materials expenditures for building new products prototypes during 2011.

Approximately 50% of our net research and development expenses in 2011 resulted from our research and development efforts relating to current products and product lines, and the rest were related to developing a technology infrastructure for next generation metrology tools platforms, mainly for stand-alone metrology products.

Sales and Marketing. Sales and marketing expenses are mainly comprised of salaries and related costs for sales and marketing personnel, travel related expenses and overhead. They also include commissions to our representatives and sales personnel and royalties. Our sales and marketing expenses increased by 12.2 % to $11.4 million in 2011, compared to $10.1 million in 2010. The increase in sales and marketing expenses is mainly attributed to the increase in headcount during 2011. Sales and marketing expenses represented 11.1% and 11.7% of our revenues in 2011 and 2010, respectively. The decrease as a percentage of revenue is mainly related to the increase in revenues in 2011.

General and Administrative. General and administrative expenses are comprised of salaries and related expenses and other non-personnel related expenses such as legal expenses. Our general and administrative expenses increased by 8.8% to $3. 2 million in 2011, compared to $2.9 million in 2010. This increase in mainly attributed to additional headcount and infrastructure to support the company's growth during 2011 compared to 2010. General and administrative expenses represented 3.1% and 3.4% of our revenues in 2011 and 2010, respectively.

Benefit from Income Taxes. In 2011, based on historical taxable income from continuing operations and projections for future taxable income we determined that it is more likely than not that some of our deferred tax assets are expected to be realized, as a result we recognized $2.5 million of income tax benefit.

5.B Liquidity and Capital Resources

As of December 31, 2012, we had working capital of approximately $106.3 million compared to working capital of $94.7 million as of December 31, 2011.

Cash and cash equivalents, short-term and long-term deposits as of December 31, 2012 were $91.4million compared to $87.1 million as of December 31, 2011.

Trade accounts receivable increased from $13.4 million as of December 31, 2011 to $17.4 million as of December 31, 2012. Inventories increased from $9.6 million as of December 31, 2011 to $17.8 million as of December 31, 2012, mainly due to increase in manufacturing volumes in the end of 2012, which is also related to an expected increase in sales volumes in the first quarter of 2013.

Operating activities in 2012 generated positive cash flow of $7.7 million compared to a positive cash flow of $25.1 million in 2011.

The following table describes our investments in capital expenditures during the last three years:

	2010		2011		2012	
	Domestic	Abroad	Domestic	Abroad	Domestic	Abroad
	(in dollar thousands)					
Electronic equipment	1,872	53	3,392	15	3,903	34
Office furniture and equipment	16	25	179	70	22	1
Leasehold improvements	314	0	742	99	1,131	3
Total	2,202	78	4,313	184	5,056	38

In 2012, the investment in capital expenditures was financed from our positive operating cash flow. The increase in capital expenditures for electronic equipment in 2012 and 2011 is mainly attributable to an increase in capital expenditure of electronic equipment used for our research and development labs and systems for our demonstration centers and application development. Although we currently have no significant capital commitments, we expect to spend approximately $6 million on capital expenditures in 2013, mainly for information systems improvements (software and hardware), electronic equipment used in our research and development labs and demonstration facilities and expansion of our facilities.

Our principal liquidity requirement is expected to be for working capital and capital expenditures. We believe that our current cash reserves will be adequate to fund our planned activities for at least the next 12 months. Our long-term capital requirements will be affected by many factors, including the success of our current products, our ability to enhance our current products and our ability to develop and introduce new products that will be accepted by the semiconductor industry. We plan to finance our long-term capital needs with our cash reserves together with positive cash flow from operations, if any. If these funds are insufficient to finance our future business activities, which may include acquisitions, we will have to raise additional funds through the issuance of additional equity or debt securities, through borrowing or through other means. We cannot assure that additional financing will be available on acceptable terms.

Presently, we have no long-term debt, nor any readily available source of long-term debt financing such as a line of credit.

On February 9, 2010, we successfully consummated an underwritten public follow-on offering of 4,427,500 ordinary shares (including ordinary shares sold pursuant to the overallotment option) at a price per ordinary share of $4.15, in consideration of approximately $17.0 million, net.

With regard to usage of hedging financial instruments and the impact of inflation and currency fluctuations, see “Item 11. Quantitative and Qualitative Disclosures about Market Risk” in this annual report on Form 20-F.

5.C Research and Development, Patents and Licenses, etc.

For information regarding our research and development activities, see “Item 4B – Research and Development” in this annual report on Form 20-F.

Grants from the Office of the Chief Scientist

Under the Law for the Encouragement of Industrial Research and Development, 1984, or the R&D Law, a qualifying research and development program is eligible for grants of up to 50% of the program’s research and development expenses. The program must be approved by a committee of the Office of the Chief Scientist of the Israeli Ministry of Industry, Trade and Labor, or the OCS. The recipient of the grants is required to return the grants by the payment of royalties on the revenues generated from the sale of products (and related services) developed (in all or in part) according to, or as a result of, a research and development program funded by the OCS (at rates which are determined under the R&D Law up to the aggregate amount of the total grants received by the OCS, plus annual interest (as determined in the R&D Law). Royalties are paid in NIS linked to the dollar at the exchange rate in effect at the time of payment. Following the full payment of such royalties and interest, there is generally no further liability for payment. Nonetheless, the restrictions under the R&D Law (as generally specified below) will continue to apply even after our company has repaid the full amount of royalty payable pursuant to the grants.

The pertinent obligations under the R&D Law are as follows:

- Notices to the OCS: any change of control and any change of ownership of our ordinary shares that would make a non-Israeli citizen or resident an “interested party,” as defined in the R&D Law, requires a prior written notice to the OCS (and in the later event, the non-Israeli citizen or resident shall execute an undertaking towards to the OCS, in a form provided under the OCS guidelines).

- Local Manufacturing Obligation: The terms of the grants under the R&D Law require that we manufacture the products developed with these grants in Israel. Under the regulations promulgated under the R&D Law, the products may be manufactured outside Israel by us or by another entity only if prior approval is received from the OCS (such approval is not required for the transfer of less than 10% of the manufacturing capacity in the aggregate). This approval may be given only if we abide by all the provisions of the R&D Law and related regulations. Ordinarily, as a condition to obtaining approval to manufacture outside Israel, we would be required to pay increased royalties, as defined under the R&D Law. The total amount to be repaid to the OCS would also be adjusted to between 120% and 300% of the grants, depending on the manufacturing volume that is performed outside Israel. We note that a company also has the option of declaring in its OCS grant application an intention to exercise a portion of the manufacturing capacity abroad, thus avoiding the need to obtain additional approval. On January 6, 2011, the Israeli Knesset passed an Amendment to the R&D Law (the "Amendment"), under which it is clarified that even in the case where approval has been granted to manufacture outside Israel within the framework of approval of an R&D plan and in the case of the transfer of manufacturing at a rate that does not require the

approval of the research committee (i.e. at rate of up to 10%), a company is obligated with regard to the transfer of manufacturing outside of Israel, to pay increased royalties to the State of Israel, at the rates set forth in the R&D Law.

- Know-How transfer limitation: The R&D Law restricts the ability to transfer know-how funded by the OCS outside of Israel. Transfer of OCS funded know-how outside of Israel requires prior OCS approval and is subject to certain payment to the OCS calculated according to formulae provided under the R&D Law. If we wish to transfer OCS funded know-how, the terms for approval shall be determined according to the character of the transaction and the consideration paid to us for such transfer. Approval of the transfer of OCS funded technology to another Israeli company may be granted only if the recipient abides by all the provisions of the law and related regulations, including the restrictions on the transfer of know-how outside of Israel and the obligation to pay royalties in an amount that may be increased. The OCS approval to transfer know-how created, in whole or in part, in connection with an OCS-funded project to third party outside Israel where the transferring company remains an operating Israeli entity is subject to payment of a redemption fee to the OCS calculated according to a formula provided under the R&D Law that is based, in general, on the ratio between the aggregate OCS grants to the company's aggregate investments in the project that was funded by these OCS grants, multiplied by the transaction consideration. The transfer of such know-how to a party outside Israel where the transferring company ceases to exist as an Israeli entity is subject to a new redemption fee formula that is based, in general, on the ratio between aggregate OCS grants received by the company and the company's aggregate R&D expenses, multiplied by the transaction consideration. Such new formula enacted lately in the framework of the Amendment and came into effect on November 5, 2012 when the new Regulations for the Encouragement of Research and Development in the Industry (the Maximum Payment for the Transfer of Know-How in Accordance with Section 19B(b)(1) and (2), 5777-2012 (the "Cap Regulations") were promulgated. The Cap Regulations establish a maximum payment of the redemption fee paid to the OCS under the above mentioned formulas and differentiates between two situations: (i) in the event that the company sells its OCS funded know-how, in whole or in part, or is sold as part of an M&A transaction, and subsequently ceases to conduct business in Israel, the maximum redemption fee under the above mentioned formulas shall be no more than 6 times the amount received (plus annual interest) for the applicable know-how being transferred, or the entire amount received, as applicable; (ii) in the event that following the transactions described above (i.e. asset sale of OCS funded know-how or transfer as part of an M&A transaction) the company continues to conduct its R&D activity in Israel (for at least three years following such transfer and keeps on staff at least 75% of the number of R&D employees it had for the six months before the know-how was transferred), then the company is eligible for a reduced cap of the redemption fee of no more than 3 times the amounts received (plus annual interest) for the applicable know-how being transferred, or the entire amount received, as applicable.

Approval to manufacture products outside of Israel or consent to the transfer of technology, if requested, might not be granted.

As of December 31, 2012, we received grants from the OCS in the aggregate amount of approximately $22.4 million. We are obligated to pay royalties of 3%-3.5% of revenues derived from sales of products funded with these grants. As of December 31, 2012, our contingent liability to the OCS for grants received was approximately $19.8 million. See also Note 7A to our consolidated financial statements contained elsewhere in this report.

The funds available for grants from the OCS were reduced for 2004 and 2005, and the Israeli authorities have indicated that the government may further reduce or abolish grants of this kind in the future. Even if these grants are maintained, we might not receive them in the future and cannot presently predict the amount of any grants we might receive.

In addition to royalty-bearing grants from the OCS, in 2010, we participated in a 'Magnet' program, IMG4, sponsored by the OCS. Under the terms of this program, we were cooperating with additional companies and research institutes in Israel, organized in a consortium, for the development of advanced techniques for improved tool control. No royalties from this funding are payable to the Israeli government, however, the provisions of the R&D Law and related regulations regarding, inter alia, the restrictions on the transfer of know-how outside of Israel do apply. In general, any consortium member that develops technology as part of the consortium retains the intellectual property

rights to the technology developed by this member, and all the members of the consortium have the right, under certain conditions, to utilize and implement such technology without having to pay royalties to the developing consortium member. Since our collaboration with this consortium will not deal with issues that are part of our core technology, we believe that it will have no effect on our strong intellectual property portfolio. The IMG4 program has ended during 2010.

In addition to royalty-bearing grants from the OCS, in 2012, we participated in a 'Magnet' program, METRO 450, sponsored by the OCS. Under the terms of this program, we are cooperating with additional companies and research institutes in Israel, organized in a consortium, for the development of pre-competitive elements of 450mm solutions. No royalties from this funding are payable to the Israeli government. However, the restrictions under the R&D Law (and the regulations promulgated thereunder) relating to the transfer of know-how outside of Israel do apply. In general, any consortium member that develops technology as part of the consortium retains the intellectual property rights to the technology developed by this member, and all the members of the consortium have the right, under certain conditions, to utilize and implement such technology without having to pay royalties to the developing consortium member. Since our collaboration with this consortium will not deal with issues that are part of our